PESTERMS: A Glossary of Forest Pest Management Terms

Prepared under the direction of

Forest Pest Review Committee

of British Columbia

by

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FOREST PEST REVIEW COMMITTEE of BRITISH COLUMBIA

Precise and clear terminology is an essential requisite for effective communication. This is especially true for a multifaceted field that arouses the concern of a variety of interests. The Forest Pest Review Committee of British Columbia, which provides a forum for information exchange, discussion and recommendation among representatives of many agencies, institutions and groups concerned with forest pest management, has had ample occasion to recognize the need for a common language of forest pest management. Accordingly, in 1983, the Committee commissioned the compilation of a glossary of pest management terms as a tool for improving communication among and within the constituencies it serves.

I am pleased to introduce the resulting publication. A Glossary of Forest Pest Management Terms is a concise and readable reference which will be of use to forestry professionals, managers of other wildlands resources, and interested members of the public.

Forest pest management is a rapidly developing field. As forest pests become better understood and new management techniques become available, the language of pest management will evolve. The Forest Pest Review Committee will ensure that the glossary will be revised as the need arises. Comments and suggestions should be sent to the Chairman of the Forest Pest Review Committee, c/o Protection Branch, B.C. Ministry of Forests, 1450 Government Street, Victoria, B.C. V8W 3E7.

W. Young,
Chairman

May 1984

PREFACE

Forest pest management is a complex, multidisciplinary endeavor. To be conducted effectively and harmoniously, it requires communication among professional and lay individuals with a variety of backgrounds. In 1983, as a result of discussions about the importance of improving such communication, the Forest Pest Review Committee of British Columbia commissioned the compilation of a glossary of forest pest management terms for use in British Columbia. We hope this glossary will also be of value to pest managers and resource managers elsewhere.

The glossary is not intended to supersede current technical publications such as the Society of American Foresters *Forestry Terminology*, the Federation of British Plant Pathologists' *Guide to the Use of Terms in Plant Pathology*, or J.R. de la Torre-Bueno's *Glossary of Entomology*. It also complements rather than duplicates or replaces the glossary contained in the *Handbook for Pesticide Applicators and Pesticide Dispensers* published by the Pesticide Control Branch, B.C. Ministry of Environment. We have gathered together terms used in the literature and practice of forest pest management in order to supplement these publications and provide definitions for terms which have come into use since their publication.

For the reader, a glossary must provide definitions of terms as they are encountered. For the writer, it must provide guidance as to correct or preferable usage. We have attempted to balance these requirements by providing only one definition for most terms, by including several definitions for terms used in more than one sense, and by discussing at some length those few terms about which there is disagreement.

The list of terms included in the glossary was generated by examination of glossaries and textbooks in forestry, entomology and plant pathology. Additional terms were suggested by B.C. Ministry of Forests pest management personnel and by other reviewers, both within and outside the Ministry. Many additional publications were consulted during preparation of the manuscript; these are listed in the "Sources" section on pages 32 - 34.

Dr. Robert F. DeBoo, Mr. John Henigman, Mr. Peter Hall and Dr. John A. Muir of the B.C. Ministry of Forests, Protection Branch, reviewed early drafts; members of the Forest Pest Review Committee of B.C. and other Canadian Forestry Service and B.C. Ministry of Forests staff reviewed prepublication drafts. Personnel of Forintek Canada Corp., and faculty members of the Department of Biological Sciences, Simon Fraser University, and the Faculty of Forestry, University of British Columbia were consulted regarding specific terms. This assistance is gratefully acknowledged. Funding for this project was made available by a grant from the British Columbia Ministry of Forests to Simon Fraser University.

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ABBREVIATIONS AND CROSS-REFERENCING

Terms which are defined elsewhere are indicated in the text of other entries by being printed in SMALL CAPS and each individual term is preceeded by a bullet (•) to help a reader distinguish between single and multi-word terms. An equals sign (=) before a term indicates that it is a synonym. Many definitions end with a reference to other entries: the abbreviation *Cf* stands for *compare with* an antonym or other term from which a distinction has been made, while *See* suggests that the reader turn to a similar or related term.

A

abatement Reduction of a nuisance or of a harmful effect. Often applied particularly to measures taken to reduce pollution.

abdomen Posterior body region of •INSECTS and other arthropods; bears no functional legs in •ADULT •STAGE. Cf •THORAX.

abiotic Non-living.

abiotic disease =•DISORDER

abiotic pathogen (=abiotic •DISEASE agent, =environmental stress factor) A non-living cause or inducer of •DISEASE, such as an air pollutant, a toxic metal ion in the soil, a nutrient imbalance caused by nutrient shortage in the soil or inadequate development of •MYCORRHIZAE, extremes of temperature, or extremes of water availability.

acaricide A •PESTICIDE used to •CONTROL or •MANAGE •MITES or ticks.

active ingredient (=a.i.) 1. The component of a •PESTICIDE •FORMULATION to which the pesticidal effect is attributed. Rate of application of a pesticide formulation is usually stated in terms of the amount of a.i. Cf •CARRIER. 2. The definition of a.i. in the regulations under the •PEST CONTROL PRODUCTS ACT includes •SYNERGISTS.

adult Fully grown individual, usually sexually mature (in •INSECTS, =imago).

advanced decay A stage of wood •DECAY in which the wood has become definitely changed in appearance, character, and composition, with loss of structural strength.

adventitious Refers to a plant organ formed in an unusual position or at an unusual time in development, as in adventitious •SHOOTS produced following •DEFOLIATION by •INSECT •PESTS. Cf •EPICORMIC.

adventitious bud A bud produced irregularly on an older portion of a plant and not at the tip of a •STEM or in the axil (i.e. the upper angle between leaf and stem) of a leaf. May be a response to •DEFOLIATION or other •PEST attack or to •CAMBIUM injury or other wounding, but these are only a few of many possible ways the formation of such a bud may be induced.

adventitious root A root arising from aerial parts of a plant, e.g. from a •STEM or leaf, or from an underground stem or from a relatively old root. May be formed in response to wounding or severing of a leaf or stem, but this is only one of many possible ways the formation of such a root may be induced. The roots which grow from a stem cutting are adventitious. See •VEGETATIVE REPRODUCTION.

aerial application Application of a •PESTICIDE from the air, usually from either a •ROTARY- or •FIXED-WING aircraft. Cf •GROUND APPLICATION.

aerial shoot •STEM-like portion of a •DWARF mistletoe plant outside the •HOST bark. Its primary function is reproduction. A group of aerial shoots is sometimes referred to collectively as an aerial plant.

aestivation Passing of the summer or a hot dry season in a •DORMANT or •DIAPAUSING condition, in which metabolic activity is greatly reduced, e.g. certain •INSECTS, bulbous plants. Cf •HIBERNATION.

aggregation 1. The clumping of individuals in a •BIOTIC •COMMUNITY. 2. Massing of male and female •ADULT •BARK BEETLES or other •INSECTS on a tree under attack.

aggregation pheromone •PHEROMONE released by either or both sexes of an •INSECT which attracts both males and females to a given location, e.g. the •AGGREGATION pheromones of •BARK BEETLES which mediate •MASS ATTACK on a •HOST tree.

allelochemic A chemical substance emitted by individuals of one •SPECIES which influences the behavior or physiology of individuals of other species. See •ALLOMONE, •KAIROMONE, •SYNOMONE. Cf •PHEROMONE.

allelopathic Said of a relationship or interaction characterized by •ALLELOPATHY.

allelopathy Biochemical inhibition between plants or between plants and soil •MICROORGANISMS, often due to release of metabolic substances such as terpenes into the soil. Cf •ANTIBIOTIC.

allomone A chemical emitted by an individual of one •SPECIES which, when contacted by an individual of a second species, induces a behavioral or physiological response favorable to the first. See •ALLELOCHEMIC, •SEMIOCHEMICAL. Cf •KAIROMONE, •PHEROMONE, •SYNOMONE.

allopatric Condition in which •SPECIES or •RACES live in geographical isolation sufficient to prevent gene exchange. Cf •SYMPATRIC.

alternate host One of two or more unlike •HOSTS required by a •HETEROECIOUS •INSECT (e.g. •GALL APHID), •FUNGUS (e.g. •RUST) or other organism to complete its development. See •ALTERNATING GENERATIONS, •PRIMARY HOST. Cf •ALTERNATIVE HOST.

alternating generations In some •INSECTS and •FUNGI, obligatory changes of •HOST •SPECIES from one generation to another.

alternation Successive occurrence of a •FUNGAL •PARASITE on two •ALTERNATE HOSTS during its •LIFE CYCLE.

alternative host One of several plant, •INSECT or other •HOST •SPECIES suitable for a given •PARASITE, no one of which is essential for completion of the latter's •LIFE HISTORY. Cf •ALTERNATE HOST.

ambrosia beetles Small, usually cylindrical •BEETLES, in the families Scolytidae and Platypodidae, the •ADULTS of which mine in moist wood, •INOCULATING it with an ambrosia •FUNGUS on which they and their •LARVAE feed. Examples are *Trypodendron lineatum* and *Gnathotrichus sulcatus* (Scolytidae) and *Platypus wilsoni* (Platypodidae).

anal segment Last •ABDOMINAL segment of an •INSECT.

analog (=analogue) A synthetic chemical which is similar in structure to a naturally occurring chemical and mimics some or all of its effects.

angiosperm A 'flowering plant', i.e. a member of one of the two major classes of •SEED- bearing plants, characterized by the production of seed enclosed in an ovary. Trees in this group, and their timber, are commonly called hardwoods. Cf •GYMNOSPERM.

antagonism 1. A relationship between different organisms in which one partly or completely inhibits the growth of the other or kills it, often due to the effects of •TOXIC chemicals, e.g. •ANTIBIOTICS, released into the •SUBSTRATE, or to creation of unfavorable living conditions (e.g. exhaustion of food supplies). 2. Opposing action of two or more chemicals, such that the action of one is impaired or the total effect is less than that of one component used separately. Cf •COMPATIBLE, •SYNERGISM.

antibiotic 1. A chemical produced by a •MICROORGANISM which is able to inhibit the growth of or kill another microorganism. 2. A synthetic •ANALOGUE of a natural antibiotic.

aphid A small pear-shaped, soft-bodied •INSECT, in the order Homoptera, usually placed in one of the families Aphididae, Eriosomatidae, or Adelgidae (Chermidae), some forms with delicate transparent wings, which •INFESTS the tender growing portions of plants, sucks their juices, and may induce •GALLS. See •GALL APHID.

apical meristem (= growing point, = shoot apex, root apex) In plants, region of primary tissue initiation. A group of •MERISTEMATIC cells at the tip of a root or •SHOOT that by division produce the cells which initiate the primary tissues of root or shoot. May be •VEGETATIVE, initiating vegetative tissues and organs, or reproductive, initiating reproductive tissues and organs. See •MERISTEM.

apothecium An open or cup-shaped •FRUITING BODY, produced by certain •ASCOMYCETE fungi, with the asci (•SPORE-containing sacs) on the inner surface. Cf •PERITHECIUM.

application (timing of) •PESTICIDES must be applied when the •TARGET organism is in a •SUSCEPTIBLE stage of development. In •WEED •CONTROL and •VEGETATION MANAGEMENT, timing of •HERBICIDE application with respect to weed and crop •EMERGENCE or •DORMANCY is an important basis for selectivity of action. Herbicide label directions may thus refer to •POSTEMERGENCE, •PREEMERGENCE, •PREPLANT or other application of the material. See •NONSELECTIVE HERBICIDE.

appraisal See •DAMAGE APPRAISAL.

arboricide (= •SILVICIDE) A •PESTICIDE used to kill or inhibit the growth of unwanted trees or, in some instances to kill •BARK BEETLES in the inner •BARK. The term •HERBICIDE is commonly used to cover all •PHYTOCIDES, including arboricides and silvicides.

ascomycete Organism belonging to one of the major classes of •FUNGI, characterized by the production of usually 8 sexual •SPORES contained in sacs. Includes leaf •INFECTING and •CANKER producing fungi, many of which are destructive to trees. See •ASCOSPORE, •ASCUS.

ascospore Sexual •SPORE of an •ASCOMYCETE •FUNGUS, contained in a sac called the •ASCUS.

ascus (plural = asci) A membranous sac containing eight, or some other multiple of four, sexually formed •ASCOSPORES of an •ASCOMYCETE •FUNGUS.

assessment See •DAMAGE APPRAISAL.

atrophic Abnormally small size of an organ, due to pathological reduction in growth of its tissues.

attack intensity ratings Qualitative evaluations, as 'heavy,' 'moderate,' 'light', of the degree to which a given •STAND is •INFESTED with or •DAMAGED by a particular •PEST. Frequently used in marking •SKETCH-MAPS in aerial •SURVEYS.

attractant A substance or odor that affects behavior by attracting an •INSECT or other animal to a particular area. Utilized in •POPULATION •SURVEY or •CONTROL. See •PRIMARY ATTRACTION, •SECONDARY ATTRACTION.

autoecious Said of a •PARASITE, particularly a •RUST •FUNGUS, that completes its •LIFE CYCLE on one •HOST. The opposite of •HETEROECIOUS. Cf •DIOECIOUS, •MONOECIOUS.

avirulent (= •NON-VIRULENT)

B

B.t. (= *Bacillus thuringiensis*) A •BACTERIAL •PATHOGEN of •INSECTS, particularly •LARVAE of mosquitoes and •MOTHS. Used as a •MICROBIAL •INSECTICIDE against agricultural •PESTS, mosquitoes and some forest •DEFOLIATORS.

Bacillus Thuringiensis = •B.t.

bacterium (plural = bacteria) A one-celled •MICROORGANISM that lacks chlorophyll and a true nucleus and multiplies by simple fission.

baiting The use of food, water, •SEMIOCHEMICALS or other •ATTRACTANTS to lure animals into a particular area for purposes such as •MONITORING their distribution or numbers, harvesting them, controlling their movements, or reducing their numbers.

band 1. To encircle a tree trunk with any material which protects it against the passage of •INSECTS. 2. Applying •PESTICIDES as a spray, dust or granules, locally in a band or bands and not to the entire ground area.

bark 1. A non-technical term for all the plant tissues external to the wood. 2. The •PERIDERM plus layers of •VASCULAR tissue cut off from the rest of the •STEM by the development of the periderm. If •BARK is used in the wider sense of 1., the tissue external to the periderm is called the 'outer bark.'

bark beetles Small, often cylindrical •BEETLES in the family Scolytidae that bore through the •BARK of •HOST trees to lay their eggs and as •LARVAE tunnel and feed in the inner bark. Important genera include *Ips*, *Dendroctonus* and *Scolytus*.

barking See •DEBARKING.

basal area 1. The area of the cross section of a tree •STEM near its base, generally at breast height (i.e. 1.3 m above the point of germination) and inclusive of •BARK. See •DIAMETER AT BREAST HEIGHT. 2. The area in square meters per hectare of the cross section at breast height of all the trees of a forest, •STAND or forest type.

basal cup The cup-like remnant of a •DWARF MISTLETOE •INFECTION which remains visible on the •BARK long after the disintegration of an •AERIAL SHOOT.

basal (bark) treatment A treatment for killing trees and bushes in which an •HERBICIDE (•ARBORICIDE) is applied to a band of •BARK encircling the tree near the ground.

basidiomycete Organism belonging to one of the major classes of •FUNGI, characterized by the production of groups of four sexual •SPORES (•BASIDIOSPORES) borne on the surface of a specialized cell, called a •BASIDIUM. Examples are •RUSTS, smuts, mushrooms, and bracket fungi. Many wood-•DECAYING fungi belong to this group.

basidiospore Sexual •SPORE of a •BASIDIOMYCETE fungus, formed on the outside of a specialized structure called the •BASIDIUM.

basidium (plural = basidia) A tiny, club-shaped structure formed at the tip of a •HYPHA of a •BASIDIOMYCETE •FUNGUS and bearing four (or sometimes eight) sexually formed •BASIDIOSPORES.

beetle A member of the •INSECT order Coleoptera, characterized by •ADULTS with hardened leathery forewings (•ELYTRA) and chewing mouthparts, •COMPLETE metamorphosis, and •LARVAE (•GRUBS) with well-developed mouthparts.

benefit-cost analysis (= cost-benefit analysis) A technique for evaluating alternative investments or •MANAGEMENT strategies by comparing the so-called 'present value' of total expected benefits with the 'present value' of total expected costs for each alternative. Since the value of money decreases with time, the costs to be incurred and the benefits to be realized over time are estimated in terms of constant dollars on hand, i.e. their 'present values'. Only costs and benefits which can be quantified in money terms can be directly incorporated

into the calculations. The comparisons of benefits with costs are often made by calculation of ratios of benefits to costs. The ratio must be greater than one for a •MANAGEMENT strategy to be considered economically efficient. See •OPPORTUNITY COST.

bioaccumulation (= biomagnification) The increase in concentration of a chemical substance through the biological •TROPHIC levels (build up in food chain).

biocide 1. A •TOXICANT, i.e. a material capable of producing lethal damage to metabolic systems, which produces effects in all forms of living organisms in a more or less comparable range of exposure. 2. More generally, any material that is lethal to an organism, but not necessarily to all organisms.

biogeoclimatic zone A geographical area (also a unit of •ECOSYSTEM classification), defined by the vegetation growing therein, which provides a grouping of ecosystems that are influenced by one kind of regional climate.

biological control 1. Deliberate regulation of a •PEST •SPECIES to acceptable levels by conservation and/or augmentation of the •NATURAL ENEMY complex or by introduction of •EXOTIC natural enemies. 2. In plant pathology, biological control has been defined more broadly as: the reduction of the amount of •INOCULUM or of •DISEASE-producing activity of a •PATHOGEN through manipulation of the •ENVIRONMENT and/or •ANTAGONISTIC organisms or by mass introduction of one or more antagonists. Some pathologists feel that 'manipulation of the environment' should be considered 'cultural' rather than 'biological' control.

biological pesticide A •PESTICIDE in which the •ACTIVE INGREDIENT is a living organism e.g. •VIRUS, •BACTERIUM or •NEMATODE, which is applied in a manner analogous to that used for a conventional pesticide. See •*BACILLUS THURINGIENSIS*, •MICROBIAL PESTICIDE.

biotic Pertaining to, caused by, or produced by living organisms. Cf •ABIOTIC.

biotype 1. A subdivision of a •SPECIES containing a group of organisms genetically identical or almost identical. 2. A biological strain of a •SPECIES which may be morphologically indistinguishable from other members of the species and/or exhibits distinctive physiological characteristics, particularly in regard to its ability to successfully utilize a •PEST-•RESISTANT •HOST (i.e., = pathotype) or to act as an effective beneficial species. 3. A subgroup within a •SPECIES usually characterized by the possession of a single or a few features in common. Cf •ECOTYPE, •RACE.

bivoltine Condition in which an organism (e.g an •INSECT) produces two •GENERATIONS in a year. Cf •UNIVOLTINE, •MULTIVOLTINE.

black check 1. A dark •STAIN in the •SAPWOOD and •HEARTWOOD surrounded by abnormal formation of wood. Caused in •CONIFERS by bark •MAGGOTS, pitch moths, and probably bark moths; in oaks by roundheaded borers. 2. A small, •RESIN-FILLED pocket in wood, formed as a result of •INSECT injury.

black fleck Small dark •FLECKS, running parallel to the grain of •DECAYED wood, characteristic of the activity of certain •FUNGI, e.g. *Fomes annosus*.

black heart A condition, not necessarily associated with •DECAY, in which a black or dark brown zone or core develops in a tree, simulating •HEARTWOOD in •SPECIES (mostly hardwoods) that do not normally differentiate it.

black streak (= black check) A small dark pocket, tangentially extended, from which a thin, narrow dark streak extends in both directions longitudinally. Found chiefly in western hemlock, often associated with •INFESTATION by bark •MAGGOTS.

black-top 1. The condition of a dead tree after all the needles have fallen. 2. In the case of a •BARK BEETLE •INFESTATION, a tree two or more years after the beetles primarily responsible for its death have left it. Identical to •GREY ATTACK as defined in the B.C. Ministry of Forests Cruising Manual.

bleeding The exudation of natural •GUM, oil, •RESIN etc. from trees or converted timber following wounding. Cf •RESINOSIS.

blight 1. Sudden dying of •SHOOTS, foliage, or blossoms. Specific terms are sometimes applied to blights of individual parts, as leaf blight, needle blight, twig blight, bud blight. In needle blight, attack continues throughout the summer, and destroys older as well as the current year's foliage. Cf •NEEDLE CAST, •WILT. 2. A •DISEASE characterized by this •SYMPTOM.

blind conk (= swollen knot) A pronounced swelling around a knot, resulting from the tree's attempt to heal over an abortive •CONK or the point from which an old conk has dropped. The affected knot may be partially covered by sound wood.

blister 1. A small cavity formed in •BARK or leaves by the separation and raising of the surface layers, sometimes due to •INSECT or •FUNGAL attack. 2. Any •DISEASE characterized by this •SYMPTOM, e.g. those caused by •FUNGI in the genus *Taphrina* on elm and poplar or by *Cronartium ribicola* (white pine blister rust).

blotch 1. A large, irregularly shaped •NECROTIC or discolored area on a leaf, •SHOOT or •STEM. 2. A •DISEASE characterized by this •SYMPTOM.

blowdown = •WINDTHROW.

bluestain (= blue sapwood stain) A deepseated •FUNGAL discoloration, predominantly blueish, but sometimes grey, black or brown, confined mostly to •SAPWOOD, which does not cause a loss of structural strength. Often associated with •BARK BEETLE or •AMBROSIA BEETLE attack. May cause •DEGRADE of lumber. See •BROWN STAIN, •SAP-STAIN.

bole The •STEM of a tree, once it has grown to substantial size.

bole scar A large, elongated, diamond-shaped scar on the •STEM of a tree. May be due to injury or severe •DWARF MISTLETOE or •RUST infection.

boring dust (= bore dust) 1. •FRASS of wood-eating •INSECTS. 2. Fine, light-colored powdered wood, cast out of tunnels made by •INSECTS, such as •BARK BEETLES, •AMBROSIA BEETLES, and carpenter ants; an early sign of attack by these insects.

broadcast burning A type of •PRESCRIBED BURNING in which a controlled fire is allowed to burn over a designated area within well-defined boundaries, for reduction of fuel hazard, as a •SILVICULTURAL treatment (e.g. in •SITE PREPARATION) or both. Sometimes used to sanitize an area •INFESTED by •PESTS, e.g. •BARK BEETLES, •SLASH-INFESTING •INSECTS or •MISTLETOE in •RESIDUAL trees.

brood 1. Progeny of the same female, produced within a certain period, e.g. a clutch of birds' eggs, honey bee brood of a certain type, season or year, the progeny of one female •BARK BEETLE. Used mainly with reference to birds, •INSECTS, reptiles, amphibians and mammals. 2. All the individual •INSECTS which hatch

at about one time from eggs laid by the preceding •GENERATION, and which normally mature at about the same time, as in •BARK BEETLE brood developing under the •BARK of trees.

brood tree 1. A tree that is actively •INFESTED, for example by •BARK BEETLES. 2. A tree from which the next •GENERATION of •BARK BEETLES will •EMERGE.

broom See •WITCHES' BROOM.

brown and burn A •VEGETATION MANAGEMENT technique in which an oil or a •DESICCANT •HERBICIDE is applied in midsummer to green vegetation, especially hardwoods and •BRUSH. After allowing 10 to 20 days for the brush to dehydrate, the area is burned. See •SPRAY AND BURN. Cf •SLASH AND BURN.

brown rot (= brown cubical rot) A light to dark brown •DECAY caused by •FUNGI which attack the •CELLULOSE and associated carbohydrates in wood. The chiefly •LIGNIN residue is friable and splits along regular planes in the •ADVANCED stages of decay. Cf •WHITE ROT.

brown stain (= fungus brown stain) A dark brown •STAIN, confined mainly to the •SAPWOOD, caused by •FUNGI and possibly also by other •MICROORGANISMS; occurring mostly in pines.

browsing Feeding on the buds, •SHOOTS or leaves of woody plants or sparsely growing herbage by livestock or wild animals. Cf •GRAZING.

brush 1. Woody vegetation, such as alder, broadleaf maple, or salmonberry. Competes with crop trees, particularly recently planted seedlings or young natural regeneration, but often provides desirable cover on wildland rights of way. 2. •SHRUBS and •STANDS of short, scrubby tree •SPECIES that do not reach •MERCHANTABLE size. Many species, such as willow and red osier dogwood are valuable browse and cover for wildlife. See •RIPARIAN VEGETATION.

brush control •CONTROL of woody plants such as brambles, sprout clumps, •SHRUBS, trees and vines.

brushing and weeding Elimination or reduction, by •MANUAL or •CHEMICAL means, of competition to seedlings of desired •CONIFER •SPECIES from •BRUSH and •HERBACEOUS •WEEDS.

budworm A •MOTH which in its •LARVAL •STAGE feeds on buds and •SHOOTS early in the season and later feeds on expanded foliage. Budworms, such as the western spruce budworm, *Choristoneura occidentalis*, are important forest •DEFOLIATORS.

buffer zone (= buffer strip; = isolation strip) 1. An area maintained around an experimental or •SAMPLE plot to ensure that the latter is not affected by any treatment applied to the area outside them both. See •EDGE EFFECT 2. An unlogged strip or zone maintained along water bodies or around habitations. 3. A zone located between a •PESTICIDE treatment area and a •PESTICIDE FREE ZONE. Pesticides may not be deliberately applied in this zone, but it is permissible for pesticides to reach it via •DRIFT, run-off, or leachate. Cf •PESTICIDE FREE ZONE. 4. A strip around a cut block in which •SUSCEPTIBLE tree •SPECIES have been •ERADICATED so that •DWARF MISTLETOE cannot invade regenerating trees within the cut block.

bug Any •INSECT in the order Hemiptera and some in the order Homoptera. Characterized by sucking mouthparts.

bug-tree A colloquial term referring to any tree that contains active •BARK BEETLE •BROODS.

burl A woody excrescence on a •BOLE, branch, buttress or •RHIZOME, having a highly contorted grain. Burls are more or less rounded in form, and usually result from the entwined growth of a cluster of •ADVENTITIOUS BUDS. Cf •GALL.

butt rot A •ROT developing in and characteristically confined to the base or lower •BOLE of a tree.

butterfly A member of one of the main divisions of the •INSECT order Lepidoptera, characterized by •ADULTS with slender bodies, broad colorful wings, antennae ending in clubs, and •DIURNAL in habit. Lepidoptera are characterized by •COMPLETE METAMORPHOSIS, adults with four membraneous wings largely covered with scales, a long, coiled proboscis and slender, sometimes feathery antennae. •LARVAE are called •CATERPILLARS. Cf •MOTH.

C

callow adult (= teneral adult) Newly •MOULTED •ADULT •INSECT, before the •EXOSKELETON has hardened fully; often pale in color. Usually refers to •BEETLES or ants.

callus A mass of soft tissue that forms on or at the edges of wounded or infected portions of •STEMS and roots.

cambium (= vascular cambium) The actively dividing layer of cells which produces a •VASCULAR plant's conducting tissues, thus increasing the girth of a branch, trunk or •STEM. See •MERISTEM.

canker 1. A sharply defined (•LOCALIZED) area of •DISEASED tissue, often swollen or sunken, in the •BARK and •CAMBIUM of a main root, •STEM or branch. Reaction of the •HOST plant to •INFECTION may result in massive overgrowth of the infected area by surrounding tissues. 2. A •DISEASE characterized by this •SYMPTOM.

canopy The more or less continuous cover of branches and foliage formed by the •CROWNS of adjacent trees in a •STAND.

carrier 1. A •HOST which harbors a •PARASITE without showing •SYMPTOMS, and which may or may not act as a source of •INFECTION for other hosts. Cf •VECTOR. 2. An inert material serving as a vehicle for the •ACTIVE INGREDIENT or •TOXICANT in a •PESTICIDE •FORMULATION.

carrying capacity The number (or weight) of organisms of a given •SPECIES and quality that can survive in, and not cause deterioration of, a given •ECOSYSTEM through the least favorable •ENVIRONMENTAL conditions that occur during a stated interval of time.

caterpillar •LARVAL •STAGE of a •MOTH or •BUTTERFLY (Lepidoptera) or of a sawfly (Hymenoptera). Soft-bodied, cylindrical in form, with several pairs of •ABDOMINAL prolegs in addition to the true (•THORACIC) legs.

catface 1. A •DEFECT on the surface of a tree or log resulting from a wound. 2. A well defined healing or healed wound on the •BOLE of a tree, usually at the base. 3. A deformation in fruit induced by •INSECT feeding during development of the fruit.

causal agent The organism or •ABIOTIC agent that induces a given •DISEASE. To be distinguished from the disease itself, which includes a •HOST response. See •PATHOGEN.

cellulose A complex carbohydrate, consisting of long chainlike polymers of linked glucose molecules. The main component of the cell walls of most plants.

check 1. (= untreated check, check plot) In a field experiment or •OPERATIONAL TRIAL, a plot or area which is left untreated for comparison with treated plots or areas.

Fills the role, in so far as is possible, of an experimental •CONTROL. 2. Longitudinal fissure in a log or tree, caused by drying following cutting or after death due to •DISEASE or •INSECT attack. (= checking) 3. A condition in which plant growth is markedly reduced or even arrested through e.g. •COMPETITION, state of the soil or •DISEASE. Individual trees or •STANDS in this condition are said to be 'in check' (= checked, stagnant, locked).

chemical control Use of a chemical •PESTICIDE to •CONTROL a •PEST •POPULATION. Cf •BIOLOGICAL control, •MANUAL control, •MECHANICAL control, •SILVICULTURAL control.

chitin Polyacetylglucosamine, a polymer that constitutes a major component of •INSECT •EXOSKELETON and •FUNGAL cell walls. See •CUTICLE.

chlorosis A yellowing of normally green tissue, due to destruction or reduced production of chlorophyll, often a •SYMPTOM of some mineral deficiency, •DISEASE, feeding by sucking •INSECTS, root or stem •GIRDLING, or extremely reduced light. A distinction is sometimes drawn between lack of color due to growth under insufficient light (•ETIOLATION) and that due to some other cause (chlorosis).

chlorotic Suffering from •CHLOROSIS.

chronic symptoms •SYMPTOMS that persist over a long period of time.

clipping 1. Mammal feeding producing a smooth oblique (scissor-like) cut on woody shoots. 2. Mechanical method of removing •PEST •INFESTATION or •DAMAGE, as in •LEADER clipping of spruce or pine to remove terminal •WEEVIL •BROODS.

cocoon Silken case spun by an •INSECT •LARVA, in which it •PUPATES.

co-dominant (trees) In an even-aged group of trees or •STAND, those trees whose foliage and branches form the general level of the •CROWN cover. See •CROWN class. Cf •DOMINANT, •INTERMEDIATE, •SUPPRESSED.

colonization 1. (= invasion) The process by which a newly exposed bare ground area, e.g. after a rock slide or fire, acquires a plant cover. 2. Location of a suitable •HOST tree by •BARK BEETLES, •AGGREGATION of sufficient numbers of beetles on the tree to overcome its defenses, and establishment of an egg •POPULATION in •GALLERIES under the •BARK. 3. Establishment of a •SAPROPHYTE or a •FACULTATIVE PARASITE on or in a particular •SUBSTRATE, such as a tree stump. Cf •INFECTION, •INFESTATION. 4. The establishment of a •PARASITE or •SAPROPHYTE on or in its •HOST or •SUBSTRATE. Cf •INFECTION, •INFESTATION, •PENETRATION.

colony 1. A group of organisms living together or in close proximity, sometimes forming an integrated society, as in ants or termites. 2. A group of individuals that have recently become •ESTABLISHED in a new area. 3. A collection of individual •MICROORGANISMS, such as •BACTERIA or yeasts, or a group of •FUNGAL •HYPHAE, growing together, often derived from single cell or •SPORE.

color infrared photography (= false-color photography) Use of color infrared film, which contains three dye layers sensitive to green, red and near-infrared wavelengths, respectively. Such film can be used to distinguish normal plants from •STRESSED plants, in which light reflection in the near infrared range is reduced. Other differences in reflection are also enhanced, e.g. making •CONIFER foliage more easily distinguishable from hardwood foliage. Haze interferes less with clarity than on regular color film. Cf •COLOR PHOTOGRAPHY.

color photography Use of color film, which contains three dye layers sensitive to blue, green and red light respectively, thus presenting objects in their familiar colors. The sensitivity of this film to blue light means that scattering of these wavelengths by haze causes reduced clarity. Cf •COLOR INFRARED PHOTOGRAPHY.

commensalism A relationship in which two or more different organisms live together to the benefit of one and without harm to the other. •MUTUALISM — •COMMENSALISM — •PARASITISM may be viewed as a continuum, without sharp boundaries between these qualities of relationship. See •SYMBIOSIS.

commercial thinning Any type of •THINNING producing •MERCHANTABLE wood that is sold. Usually, thinning in older immature stands to provide an interim •HARVEST and some financial return while maintaining or restoring a high quality and/or rate of growth in well-spaced final crop trees.

community A naturally occurring group of organisms belonging to a variety of different •SPECIES, occurring together in the same •HABITAT or area and interacting with each other. Typically characterized by reference to one or more dominant or prevalent species. Cf •ECOSYSTEM.

compatible 1. A relationship between a •HOST and a •PATHOGEN in which •DISEASE can develop. 2. Capable of acting together. Chemicals are said to be compatible when neither affects the action of the other. Cf •ANTAGONISM, •INCOMPATIBILITY, •SYNERGISM.

competition Negative interactions between individuals, of either the same or different •SPECIES, which utilize common and limited resources, e.g. nesting sites, nutrients or prey.

complete metamorphosis Type of •METAMORPHOSIS in which an •INSECT develops through four •STAGES of substantially different form: egg, •LARVA, •PUPA, •ADULT. See •HOLOMETABOLOUS. Cf •GRADUAL METAMORPHOSIS, •HEMIMETABOLOUS, •INCOMPLETE METAMORPHOSIS.

complex A group of similar and related •SPECIES of •FUNGI or other organisms, often so designated because species differences have not been resolved by taxonomists.

complex disease A plant •DISEASE condition that is induced by the action of two or more •PATHOGENS, •ABIOTIC disease agents or a combination thereof.

cone cutting 1. Removal of cones from trees by squirrels. 2. Bilateral slicing of cones in order to evaluate the cone crops for filled •SEED, •INSECT damage, etc.

conidium (plural = conidia) In •FUNGI, a •SPORE formed asexually, usually borne exposed at the tip or side of a specialized •HYPHA (conidiophore).

conifer A member of the class Gymnospermae, order Coniferales, characterized by needle- or scale-like leaves and production of naked seed in cones. These trees and their timber are commonly called softwoods. See •GYMNOSPERM.

conifer release To free commercially desirable trees from •COMPETITION by cutting or otherwise removing or suppressing the growth of nearby vegetation and branches.

conk 1. A large, protruding and firm •SPOROPHORE of a wood-•DECAYING (•BASIDIOMYCETE) •FUNGUS formed on tree trunks, branches or stumps, or a sterile growth that resembles such a sporophore. 2. In the lumber trade, the term conk refers

to •ROT found in manufactured products.

contact herbicide A •HERBICIDE which kills plant tissue by direct contact rather than after •TRANSLOCATION through the plant. Cf •SYSTEMIC PESTICIDE.

contact insecticide An •INSECTICIDE which need not be ingested to be effective, but is capable of killing an •INSECT after penetrating the •CUTICLE. Cf •SYSTEMIC PESTICIDE.

control 1. A subset of the units upon which an experiment is to be conducted. The control units, which are as identical as possible to the experimental units, participate in the experimental setting and receive handling as identical as possible to that received by the experimental group except with respect to the treatment under investigation. The results obtained from the experimental units are then compared with the results obtained from the controls. See •CHECK, •RANDOMIZATION. 2. See •PEST CONTROL.

control product See •PEST CONTROL PRODUCT.

cork A part of the •PERIDERM on the outside of tree trunks and roots, composed of dead cells which are relatively impermeable to water and gases. Protects the inner living tissues against •INSECT and •FUNGAL attack, desiccation, and mechanical injury. Often formed in response to wounding. See •PERIDERM.

cost-benefit analysis =•BENEFIT-COST ANALYSIS.

crawler The actively mobile first •INSTAR •NYMPH of •SCALE INSECTS, •GALL APHIDS and •WOOLLY APHIDS.

crepuscular Active at dusk or twilight.

crook 1. A short length of naturally curved timber. 2. A •DEFECT in trees or logs, consisting of an abrupt bend. Can result from •INSECT-induced •TOPKILL and recovery by a lateral branch. Cf •SHEPHERD'S CROOK.

crotch Those parts of a tree where the main stem or the larger branches •FORK.

crown The upper part of a tree, including the branches and foliage. The crown is often divided visually into thirds (i.e. upper crown, mid-crown and lower crown) for •SAMPLING purposes. Cf •CANOPY.

crown class A subset of the trees in an even-aged •STAND or smaller grouping, characterized by similar heights and •CROWN developments relative to the other trees in the stand. Commonly used designations are •DOMINANT, •CO-DOMINANT, •INTERMEDIATE and •SUPPRESSED.

crown closure (=canopy closure) 1. The progressive reduction of the distance between •CROWNS of adjacent trees, as in the development of a •STAND after thinning. 2. The degree to which this process has taken place.

crown gall A pronounced, localized, tumor-like swelling, which usually occurs on roots or the root crown (= •ROOT COLLAR), and results from the action of •PATHOGENIC •BACTERIA.

cruise 1. The systematic measurement of a forested area designed to estimate to a specified degree of accuracy the volume of timber it contains, by evaluating the number and •SPECIES of trees, their sizes and conditions. 2. A quantified •SAMPLE that determines the quality and quantity of timber to be sold, as well as providing information regarding •STAND productivity for estimating the •STUMPAGE value, and data for •MANAGEMENT, •PROTECTION and •SILVICULTURAL decisions. Procedures standardized by the B.C. Ministry of Forests are outlined in the Ministry's Cruising Manual.

cryptic Concealed, as in coloration; or concealing, e.g. the subcortical, cryptic •HABITAT of •BARK BEETLES.

cubical rot An •ADVANCED stage of •DECAY in which the wood shrinks and splits along rectangular planes. See •BROWN ROT.

cull 1. To reject inferior plants in the nursery or defective logs or parts of logs in the forest. See •ROGUE. 2. A plant or log so rejected.

cull factor A deduction for •DEFECT, expressed as a percentage of the estimated gross volume of a standing tree.

cull tree Live tree of •MERCHANTABLE size but which is unmerchantable now or prospectively because of •DEFECTS or •DECAY.

culmination age The age at which •MEAN ANNUAL INCREMENT of a •STAND reaches its maximum. This age is generally used as the •ROTATION AGE, if the •MANAGEMENT objective for the stand is maximization of wood volume. Cf •PATHOLOGICAL ROTATION AGE.

cultivar A selected and propagated, genetically distinct •VARIETY of a plant, distinguished from others of the same species by horticulturally, agriculturally or •SILVICULTURALLY significant characteristics.

culture 1. A laboratory-produced association of organisms, often, but not always, of one •SPECIES or •STRAIN, especially •FUNGI or •BACTERIA, maintained under controlled conditions. 2. The act of placing a particular organism under such conditions. See •ISOLATE.

current attack See •GREEN ATTACK.

cuticle 1. The non-cellular outer layer of the body wall of an •INSECT or other arthropod, usually consisting of three layers, the epi-, exo-, and endocuticle. 2. A waxy layer on the surface of leaves.

D

dbh =•DIAMETER AT BREAST HEIGHT.

damage 1. The ecological and physical effects of a •PEST on forest growth, structure, productivity, and/or on the use of forest trees or other crops. Cf •IMPACT. 2. Any type and intensity of an effect, on one or more trees, produced by an external agent, that temporarily or permanently reduces their financial, aesthetic or other value, or impairs or removes their biological ability of growth or reproduction, or both. Cf •IMPACT.

damage appraisal Estimation of the amount of •DAMAGE caused by a particular •PEST (as in 'damage appraisal cruise'), ideally, in terms of amount of lost •STUMPAGE. The term 'damage assessment' implies a less quantitative evaluation than does the term 'damage appraisal'.

damping-off •DECAY of •SEEDS in the soil or collapse and death of young seedlings, often due to •FUNGAL •INFECTION at or below the soil line. A distinction may be drawn between pre- and post-•EMERGENCE damping off, for which different fungi are responsible.

debarking 1. An •INJURY to trees caused by forestry practices, e.g. log skidding, or by the action of animals, e.g. •BARK stripping by bears and feeding by deer and rodents. In extreme cases, a tree may be •GIRDLED. Less extreme cases may lead to frost damage or entry of •FUNGAL •PATHOGENS. 2. Loosening or removal of the •BARK of a tree for any purpose. 3. Removal of •BARK from trees •INFESTED with •BARK BEETLES in order to expose and thus kill the beetles developing inside.

decay 1. The disintegration of plant tissue. Cf •NECROSIS 2. The process by which sound wood is decom-

posed by the action of wood-destroying •FUNGI and other •MICROORGANISMS, resulting in softening, progressive loss of strength and weight, and often changes in texture and color. The terms decay and •ROT are more or less interchangeable, although rot generally implies a more advanced and obvious stage. As it is often used to designate both causal organism and its effect, rot is the key term for specifying types, i.e. •DRY ROT, •SOFT ROT. See •ADVANCED DECAY, •INTERMEDIATE DECAY, •FINAL DECAY.

declivity Truncated or scooped-out termination of the •ELYTRA (thickened forewings) of certain •BEETLES. Morphological details of this area are important in specific •IDENTIFICATION of •BARK BEETLES.

defect Any irregularity in a tree, log, or wood product that reduces the volume of sound wood or lowers its durability, strength or utility value. Defects may result from •FUNGUS or •INSECT attack, growth conditions, manufacturing or seasoning practices.

defoliant A chemical which, when applied to a plant, causes the leaves to drop off.

defoliator Any organism, but more particularly an •INSECT, that can cause •DEFOLIATION.

defoliation An untimely reduction in the amount of foliage, due to •INSECT or •FUNGAL attack or other agencies, e.g. drought, storms or chemicals, as distinct from natural leaf-fall. See •NEEDLE CAST.

degrade 1. The process of lowering the value of timber or other forest products. 2. A drop in timber or lumber grade (i.e. an established quality or use classification), which may be due to •PEST-caused •DAMAGE, such as •BLUESTAIN.

degree-day The equivalent of one degree of temperature, maintained for 24 hours, above or below any specified base temperature, e.g. 2 degrees for 12 hours or 1/2 degree for 48 hours. Often used in predicting the time of incidence of •INSECT •PESTS in the spring. For purposes of plant growth and animal development, the base temperature may be the temperature above which it is considered that growth can be initiated and maintained.

density See •STAND DENSITY.

desiccant A chemical that, when applied to a plant, causes or accelerates the drying out of its aerial parts.

detection Discovery, •IDENTIFICATION, and delineation of •PEST •OUTBREAKS.

deterrent A substance that inhibits any normal behavior, such as feeding, mating or •OVIPOSITION by an organism.

deuteromycete 1. An organism belonging to the •*FUNGI IMPERFECTI*. 2. The •CONIDIAL •SPORE •STAGE of certain •ASCOMYCETES.

device See •PEST CONTROL DEVICE.

diameter at breast height (= DBH) The diameter outside the bark at 'breast height,' i.e. 1.3 m above the point of germination. A standard measurement of tree size.

diapause A resting stage of an •INSECT in which growth and development are arrested and metabolic processes are low; induced by a combination of both inherent and •ENVIRONMENTAL factors. Cf •AESTIVATION, •DORMANCY, •HIBERNATION.

dieback The gradual and progressive dying, starting at the tips, of •SHOOTS, twigs, tops, branches or roots.

diffuse canker A •CANKER which grows more rapidly than the radial growth of the tree, usually •GIRDLING the tree after several years. Common in trees infected with white pine blister •RUST.

dimorphic A term describing a •TAXON having two distinct types of individuals, differing in form, color, etc. Dimorphism may be seasonal, sexual, or geographic.

dioecious Having male and female reproductive structures on separate plants. Cf •AUTOECIOUS, •HETEROECIOUS, •MONOECIOUS.

direct suppression Action taken against a •PEST to reduce its •POPULATION, such as •PESTICIDE application, •SANITATION CUTTING, •BIOLOGICAL CONTROL. See •PEST CONTROL, •SUPPRESSION. Cf •INDIRECT SUPPRESSION.

disease Any more or less prolonged disturbance of an organism that interferes with its normal structure or function. The causes of disease are both biotic and •ABIOTIC, and include •PATHOGENIC •MICROORGANISMS, nutrient deficiencies or excesses, •INSECTS, and air pollutants. However, some •PATHOLOGISTS exclude disturbances due to •ABIOTIC factors, referring to these as •DISORDERS. A disease may be caused by more than one agent. Cf •INJURY.

disease agent (= •CAUSAL AGENT) Any agent that can induce •DISEASE, i.e. a •PATHOGENIC organism or •ABIOTIC factor.

disease cycle The sequence of events involved in the development of a •DISEASE, including the •STAGES in the •LIFE CYCLE of the •PATHOGEN and the •SYMPTOMS of the disease in the •HOST.

disorder A term sometimes applied to •DISEASE induced by an •ABIOTIC factor. See •NON-INFECTIOUS DISEASE.

dispersal The passive or active spread, on any time-scale, of animals or plants, from any point or points of origin, as in redistribution of •INSECT •LARVAE or •FUNGAL •SPORES by winds, or of •INSECT •ADULTS by flight.

disruption (of communication) (= confusion technique, = mating disruption) Effect of artifical release of •SEMIOCHEMICALS (e.g. a •PHEROMONE or its •ANALOG) to disrupt natural •SEMIOCHEMICAL communication among •INSECTS or other organisms. Examples are disruption of mating in moths by atmospheric permeation with a sex •PHEROMONE, and the disruption of •HOST SELECTION by •BARK BEETLES by release of an anti•AGGREGATION pheromone.

dissemination The transport or spread of •INOCULUM from its source to healthy plants. Cf •DISPERSAL.

distress cone crop Extraordinary, often heavy, cone-crop, induced in trees by abnormal conditions such as root •DISEASES or •ENVIRONMENTAL •STRESS.

distribution The spatial occurrence of a particular •RACE, •SPECIES or other taxonomic group.

diurnal Active during the day. Cf •CREPUSCULAR, •NOCTURNAL.

dominant (trees) 1. In a mixed •STAND or crop, that •SPECIES which is most numerous and vigorous. 2. In an even-aged group of trees or •STAND, those trees with •CROWNS extending above the general level of the crown cover formed by the foliage and branches of the •CO-DOMINANT trees. See •CROWN CLASS. Cf •INTERMEDIATE, •SUPPRESSED.

dormancy State of inhibited •GERMINATION of •SEEDS or •SPORES or inhibited growth of plant organs. Dormancy may be facultative or obligatory, often occurs when environmental conditions are unfavorable, but may be induced prior to or extend beyond the unfavorable period. Cf •AESTIVATION, •DIAPAUSE, •HIBERNATION.

dormant In a state of reduced physiological activity.

dormant application Application of •HERBICIDE as a spray, an injection or by •HACK AND SQUIRT, in late winter or very early spring, when buds are beginning to swell but have not yet opened. At this time some •ANGIOSPERM •BRUSH types are highly •SUSCEPTIBLE to treatment, while certain •CONIFERS are •RESISTANT. The •SELECTIVITY of treatment is thus enhanced at this time. See •APPLICATION (TIMING OF). Cf •POSTEMERGENCE TREATMENT, •PREEMERGENCE TREATMENT, •PREPLANT TREATMENT.

dormant spray Chemical applied in winter or very early spring before treated plants have started active growth.

double hacking •GIRDLING by means of a double frill cut around the tree, and the removal of the chips between them. Cf •FRILL GIRDLING.

drift The movement of •PESTICIDE droplets, vapor or dust by wind or air currents. When this process moves pesticide away from the •TARGET area and causes its deposition onto areas not being treated, drift constitutes one of the major hazards of pesticide application. Drift may however be used to advantage in •INCREMENTAL SPRAYING. See •VOLATILITY.

dry rot A •BROWN ROT caused by *Serpula lacrymans* or *Poria incrassata*, •FUNGI which are able to conduct moisture via •MYCELIAL STRANDS from an available source and extend their attack to wood previously too dry to •DECAY. Found chiefly in buildings.

dwarfing The underdevelopment of any organ of a plant. Cf •ATROPHIC.

dwarf mistletoe A •PARASITIC flowering plant in the genus *Arceuthobium* (family Loranthaceae), which has no apparent leaves, and occurs only on above ground parts of one or more •CONIFERS.

E

ecdysis Shedding of the epi- and endocuticle during •MOULTING by •INSECTS. See •CUTICLE.

ecdysoid Synthetic or botanical chemical which mimics effects of •ECDYSONE.

ecdysone •HORMONE which controls growth and •MOULTING in •INSECTS.

eclosion The act of an •ADULT •INSECT leaving the •PUPAL or the last •NYMPHAL skin.

ecosystem A •COMMUNITY of organisms and the •ENVIRONMENT they inhabit.

ecotype A •RACE of plants which is characterized by adaptively significant characteristics particular to a local •ENVIRONMENT. Cf •BIOTYPE.

ectendotrophic mycorrhiza A •MYCORRHIZA combining the features of •ECTOTROPHIC and •ENDOTROPHIC MYCORRHIZAE.

ectoparasite A •PARASITE that lives on the outside of its •HOST and gains nourishment by means of penetrating feeding structures or by causing exudation of host tissues or fluids. Includes some •NEMATODES and many beneficial •INSECTS that parasitize other •INSECTS.

ectotrophic mycorrhiza A type of •MYCORRHIZA, generally formed by •BASIDIOMYCETE •FUNGI, in which the fungal •HYPHAE form a closely woven envelope covering the root apex and penetrating to a limited extent between the cells of the cortex. Cf •ECTENDOTROPHIC MYCORRHIZA, •ENDOTROPHIC MYCORRHIZA.

edaphic Pertaining to or influenced by the nature of the soil.

edge effect The effect exerted by adjoining communities or •ABIOTIC factors (e.g. sunlight) on the individuals inhabiting a marginal zone at or near the perimeter of a •HABITAT. Edge effects must be considered in the development of •SAMPLING schemes and the choice of experimental and •CHECK plots. See •BUFFER ZONE (1).

edge tree A tree on the edge of a •STAND and therefore growing under conditions of light and exposure different from those prevailing within the crop or stand.

efficacy Effectiveness, as of a •PESTICIDE; ability of a product or procedure to kill or injure the specified •TARGET •PEST or to produce the specified action, based on judgements or requirements of the resource manager.

egg scar A plant wound where an •INSECT has laid its eggs, or the scar left after an •INSECT has •OVIPOSITED in a plant.

elytra (singular = elytron) Hardened, often leathery, forewings of •BEETLES, which cover the membraneous hind wings when the •INSECT is not in flight.

emergence 1. The act of an •ADULT •INSECT leaving the •HOST tissue in which it has developed, as in •BARK BEETLES emerging from a •BROOD TREE. Cf •ECLOSION, •HATCHING. 2. Appearance of a developing aerial part of a plant, particularly of a plant which has just •GERMINATED, above the surface of the soil.

emergence hole See •EXIT HOLE.

emergence period The interval between the appearance of the first and last •ADULTS of a •GENERATION or •BROOD of •INSECTS.

enation An outgrowth, usually •VIRUS-induced, from the surface of a plant organ such as a •STEM or leaf.

endemic 1. Native; •INDIGENOUS to a particular area; not introduced. Cf •EXOTIC. 2. Describing a •DISEASE which is permanently established and occurs with little variation in severity within a particular area. Cf •ENPHYTOTIC, •ENZOOTIC, •EPIDEMIC, •EPIPHYTOTIC, •EPIZOOTIC.

endoparasite A •PARASITE that lives inside its •HOST.

endophytic system Root-like, absorptive parts of •DWARF MISTLETOE within the •HOST tissues.

endotrophic mycorrhiza A •MYCORRHIZA in which the •FUNGAL •HYPHAE are entirely within the root cortex, and largely •INTRACELLULAR; generally formed by •PHYCOMYCETE fungi. Cf •ECTENDOTROPHIC MYCORRHIZA, •ENDOTROPHIC MYCORRHIZA.

end product pest See •TIMBER pest.

enphytotic A plant •DISEASE which is constantly present in a given area and causes about the same amount of •DAMAGE every year. Cf •ENDEMIC, •ENZOOTIC, •EPIDEMIC, •EPIZOOTIC, •EPIPHYTOTIC.

entomology 1. The scientific study of •INSECTS. 2. The profession of such study, e.g. as defined by the American Registry of Professional Entomologists.

entomophagous •INSECT-eating, usually applied to invertebrates. Cf •INSECTIVOROUS.

environment The combination of climatic, physical, chemical and biotic conditions which may affect the growth and welfare of an organism or a group of organisms.

environmental impact See •IMPACT(2)

enzootic A disease of an •INSECT or other animal which is permanently established in a particular area and occurs with low, relatively constant severity and frequency. Cf •ENDEMIC, •ENPHYTOTIC, •EPIDEMIC, •EPIZOOTIC, •EPIPHYTOTIC.

epicenter Geographic location in which a •PEST •OUTBREAK originates or is first evident.

epicormic shoot (= epicormic branch) A •SHOOT arising from an •ADVENTITIOUS or •DORMANT bud on

the •BOLE, stem or branch of a woody plant, often in response to a •PATHOGEN or to severe •DEFOLIATION by an •INSECT.

epidemic A widespread, and often rapidly built up, unusually high level of incidence of an •INSECT or •DISEASE or other •PEST in a human •POPULATION. Often applied loosely to such incidence in populations of other organisms. Cf •ENDEMIC, •ENPHYTOTIC, •ENZOOTIC, •EPIPHYTOTIC, •EPIZOOTIC, •OUTBREAK.

epidemiology The science which investigates the patterns of incidence and the factors influencing the spread of •DISEASE in •POPULATIONS.

epinasty Strictly, abnormal downward curving growth, caused by more rapid elongation of cells in the upper than lower side of a leaf or •STEM; often incorrectly used to mean any curling or twisting of a plant organ caused by uneven growth. May be a •SYMPTOM of •DAMAGE by exposure to a synthetic •GROWTH REGULATOR type of •HERBICIDE, such as 2,4-D.

epiphyte A plant growing on, but not nourished by, another plant.

epiphytotic A widespread and destructive •OUTBREAK of a plant •DISEASE; an •EPIDEMIC in a plant •POPULATION. Cf •ENDEMIC, •ENPHYTOTIC, •ENZOOTIC, •EPIDEMIC, •EPIZOOTIC.

epizootic An •EPIDEMIC disease in an •INSECT or other animal •POPULATION. Cf •ENDEMIC, •ENPHYTOTIC, •ENZOOTIC, •EPIDEMIC, •EPIPHYTOTIC.

eradicant 1. A •FUNGICIDE that is used to •CONTROL •DISEASE after •INFECTION has occurred. 2. A •FUNGICIDE that kills the attacking organism at the surface of its •HOST or at its source before it can reach a host, e.g. •INFECTED leaves lying on the ground, or Cf •PROTECTANT.

eradication 1. Complete elimination of a particular organism from a specific area. •PEST management today is not founded on the idea of elimination of the •PEST, but in certain situations eradication is a goal, e.g. newly introduced pests in a limited geographic area, household pests, or pests •INFESTING trees of historical or other special interest. 2. Control of a •DISEASE by eliminating of the •PATHOGEN after it is already established. Can refer to removal of •INFECTED parts of one •HOST or to removal of infected individuals from a host •POPULATION, e.g. by •SANITATION THINNING, destruction of infected •RESIDUAL trees in cut-over stands, or pruning of infected branches.

escape 1. An •EXOTIC or cultivated plant or animal later found growing wild. 2. The failure of an inherently •SUSCEPTIBLE plant to become •DISEASED because it did not become •INFECTED. See •KLENDUSITY.

established 1. Said of an introduced (•EXOTIC) organism which is persisting from year to year in its new location without human intervention. 2. In forestry, said of a plantation when adequately stocked and requiring no further general •WEEDING, and in which the young trees are almost certain to survive normal adverse circumstances. Occasionally applied to young naturally regenerated stands. See •FREE-GROWING.

etiolation Loss of color of normally green tissue, production of abnormally small leaves, and elongation of •STEMS as a result of insufficient light or •INFECTION with a •PATHOGEN. A distinction is sometimes drawn between lack of color due to growth under insufficient light (etiolation) and that due to some other cause (•CHLOROSIS).

etiolated Suffering from •ETIOLATION.

etiology 1. Examination and/or determination of the causes of a •DISEASE, i.e •PREDISPOSING factors and •ABIOTIC and/or biotic •PATHOGENS. 2. •DISEASE causation; the interactions of •HOST, •PATHOGEN or •PARASITE, and •ENVIRONMENT in relation to time.

exclusion 1. Prevention of the entry of •INFECTED or •INFESTED plants into an area free of a •PEST, e.g. by •QUARANTINE. 2. Protection from •PEST •DAMAGE by preventing exposure of a plant to a pest, e.g. by a physical barrier.

excresecence An abnormal protuberance or appendage, as a wart or a knot on a tree.

exit hole (=emergence hole) A hole made by an •INSECT, generally a young •ADULT, when leaving the plant tissue (wood, bark, fruit, etc.) in which it developed.

exoskeleton The hard, external covering of •INSECTS and other arthropods, which is periodically shed during •MOULTING to allow for growth. See •ECDYSIS.

exotic 1. Not •NATIVE. 2. A •SPECIES •INTRODUCED, either accidentally or purposefully, into an area where it does not naturally occur.

extermination The elimination of a particular organism from a structure or area. Refers to the job done by an 'exterminator,' e.g. a structural pest control operator. Cf •ERADICATION.

exudate A substance, usually liquid, formed inside a plant and discharged from healthy, •DISEASED or •INJURED tissue.

exuviae The skins (epi- plus exocuticle) cast off in •ECDYSIS by •MOULTING •INSECTS. See •CUTICLE.

F

facultative parasite An organism that can be either •SAPROPHYTIC or •PARASITIC, e.g. *Armillaria mellea*. Cf •OBLIGATE parasite.

fader Coloquial term describing a tree in transition from the •GREEN ATTACK phase to the •RED ATTACK phase.

fall-down A reduction in annual allowable cut under •SUSTAINED YIELD •MANAGEMENT, sometimes due to •PEST-caused losses of timber inventory or growth capacity.

false color See •COLOR INFRARED PHOTOGRAPHY.

fasciation In plants, a malformation of the stem, which appears enlarged and flattened, as if by fusion of several •SHOOTS. Cf •WITCHES' BROOM.

fecundity The potential rate of production of offspring of an organism or a •POPULATION, measured by the number of gametes or asexual propagules. Cf •FERTILITY.

fertility (=birth rate) 1. The capability of an organism (usually a female) to reproduce sexually. 2. In ecology, the actual reproductive performance of an organism or •POPULATION, measured by the actual number of viable offspring produced in a given time period.

field resistance •RESISTANCE to natural •INFECTION by a •PATHOGEN. A type of resistance which is observed under field conditions, but is not detected in standard laboratory tests for resistance, because it is expressed at low •INOCULUM densities and is usually sensitive to •ENVIRONMENTAL factors. •HORIZONTAL RESISTANCE is commonly of this type, but the terms are not synonomous, since 'field resistance' conveys no information about interactions between various •HOST and pathogen •RACES. Field resistance is often •POLYGENIC, but again the term carries no implication regarding the mechanism or inheritance of the observed resistance.

final decay An ultimate stage, sometimes specifically recognized, in which destruction of the wood substance has progressed very far, with partial or complete collapse of the wood structure. Cf •DECAY.

fixed-wing Refers to aircraft with stationary wings, as distinguished from helicopters which have •ROTARY-WINGS.

flag A dying or nearly dead leafy twig or branch which contrasts in color with the normal green foliage of the living tree.

flagging 1. Occurrence of conspicuous dead •SHOOTS or branches, with the foliage still present and discolored. 2. The loss of rigidity, and drooping of leaves and tender •SHOOTS preceding the •WILTING of a plant.

flashback The translocation of poison, through natural •ROOT-GRAFTING, from a chemically treated tree or plant to an untreated one, causing the latter's injury or death.

fleck 1. A minute spot, often white or translucent, often composed of •NECROTIC tissue (= necrotic fleck). 2. See •PITH FLECK.

flight period The period or periods, within a day or year, during which adult •INSECTS fly, usually involving •DISPERSAL or selection of a new •HOST or •HABITAT.

flight range The maximum distance over which •DISPERSING •ADULT •INSECTS of a particular •SPECIES generally fly.

fly A member of the •INSECT order Diptera, characterized by •COMPLETE METAMORPHOSIS, wormlike •LARVAE (•MAGGOTS), and •ADULTS with one pair of membraneous wings.

foliar application Application of a •PESTICIDE to the leaves or foliage of plants.

forb Any herbaceous plant that is neither a grass nor grass-like in form, e.g. a buttercup or sunflower.

forest entomologist A professional person engaged in the study and/or management of •INSECTS in a forest •ENVIRONMENT. See •ENTOMOLOGY.

Forest Insect and Disease Survey (= FIDS) A unit of the Canadian Forestry Service that conducts an annual overview •SURVEY of major forest •PESTS and their implications across Canada, maintains records, herbaria and •INSECT collections, and provides advice on forest •INSECT and •DISEASE conditions.

forest management 1. Generally, the practical application of scientific, economic and social principles to the administration and utilization of a forest for specified objectives. 2. More particularly, that branch of forestry concerned with its overall administrative, economic, legal and social aspects, and with application and coordination of its essentially scientific and technical aspects, especially •SILVICULTURE, •PROTECTION and forest regulation.

forest pathologist A professional person engaged in the study and/or •MANAGEMENT of •DISEASES and •PATHOGENS of forest trees.

forest pest management The planning, conduct and evaluation of activities needed to protect forest resources, products and/or facilities from unacceptable •DAMAGE or loss due to the activities of •PESTS.

forest protection That branch of forestry concerned with the prevention and control of •DAMAGE to forests arising from the action of people or livestock (particularly unauthorized felling, fires, grazing and browsing) and of •PESTS (including •INSECTS, •DISEASES and •WEEDS) and abiotic agents (including fire, storms, frost and other climatic factors).

fork (= •CROTCH) A division into branches.

form distortion loss Reduction in •MERCHANTABLE timber due to •TOPKILL and recovery or other pest-caused •DAMAGE which has resulted in multiple •LEADERS, •FORKS, etc. The wood above such distortions is often not usable for sawtimber. Cf •INCREMENT LOSS, •MORTALITY LOSS.

forma specialis (= *f. sp.*) (plural = *formae speciales*) A group of •PHYSIOLOGIC RACES of a •FUNGAL •PATHOGEN which attack a single •HOST genus or •SPECIES but are morphologically indistinguishable from races attacking other hosts.

formulation A •PESTICIDE-containing preparation developed for actual field use. A mixture of •ACTIVE INGREDIENT(s), diluents, emulsifiers, spreaders, •SYNERGISTS and/or other materials.

frass Solid excrement of •INSECTS, particularly •LARVAE. For •BARK BEETLES, loose definition combines excrement and •BORING DUST as 'frass.'

free growing (= free-to-grow) An administrative and legal term used in •SILVICULTURE and •VEGETATION MANAGEMENT. Defined in the B.C. Ministry of Forests Policy Manual (under 'Basic Silviculture — Monitoring Performance') as: "an •ESTABLISHED seedling of an acceptable •SPECIES that is free from growth-inhibiting •BRUSH, •WEED and excessive tree •COMPETITION by the time and to the standards specified or, in the absence of such specification, by five years after planting or natural regeneration." Excessive tree competition is defined in the Policy Manual as: "density levels where standard growth is repressed, [as] shown by dominant tree height being below •SITE potential."

free-living Said of an organism which lives independently rather than •SYMBIOTICALLY.

frill-girdle A series of overlapping cuts made downwards into the •SAPWOOD of a tree trunk to form a •GIRDLE into which •HERBICIDE is applied. Cf •HACK AND SQUIRT.

frost crack Radial splitting along the grain in the •STEM and branches of a tree, as a result of internal stresses set up by freezing temperatures. Such cracks may open to the surface or remain internal. Frost crack is an indicator of hidden •DEFECT due to entry of wood destroying •FUNGI.

frost heart A type of false heart in which a colored zone or series of zones develops, simulating •HEARTWOOD in •SPECIES that do not normally differentiate it; ascribed to the action of severe frost on standing timber. Cf •BLACK heart.

fructification See •FRUITING BODY.

fruiting body A complex •FUNGAL structure that contains or bears •SPORES. May be annual, functioning for at most only one season, or perennial, seasonally active for two or more years. Includes mushrooms and •CONKS.

fumigation The use of chemicals in the form of volatile liquids or gases to kill •PESTS. Usually carried out in an enclosure of some kind or restricted to a zone below the soil surface by covering with a tarpaulin or plastic sheet.

fungi imperfecti (= •DEUTEROMYCETES) One of the main classes into which •FUNGI are placed: an artificial group consisting of those fungi in which production of •SPORES by meiosis is not known to occur. Sexual forms have been identified for many fungi originally placed in this group. Many •ASCOMYCETES are referred to in the literature by names given to either the imperfect form or the sexual form without mentioning the other. Fungi assigned to this group are often called 'imperfect fungi' or simply 'imperfects.'

fungicide A •PESTICIDE capable of killing •FUNGI (•SPORES or •MYCELIUM).

fungistatic Preventing the growth of a •FUNGUS without killing it.

fungus (plural = fungi) A usually multicellular organism with •CHITIN-containing cell walls and no chlorophyll, usually composed of •HYPHAE with well defined nuclei, usually obtaining nutrition by absorbing nutrients digested by secreted exoenzymes, and usually reproducing by •SPORES.

fungus brown stain = •BROWN STAIN.

G

gall A localized proliferation of greatly modified plant tissue, producing a pronounced permanent swelling, outgrowth or other abnormal growth, induced by another organism, e.g. an •INSECT, •MITE, •FUNGUS, •BACTERIUM, or •NEMATODE. Commonly has a characteristic shape unlike any organ of the normal plant. Cf •BURL.

gall aphid An •APHID, commonly in the genera *Adelges* or *Pineus* (Adelgidae), that during feeding induces •GALLS of the •HOST tissues, and also twig •DIE-BACK and •DEFOLIATION.

gall midge A small •FLY of the family Cecidomyiidae, with pink or yellowish •LARVAE (•MAGGOTS) that cause many kinds of •GALLS on plants, generally on leaves, roots, cones, seeds or twigs; some give rise to pockets of •RESIN in the •BARK of •CONIFERS.

gallery A passage, burrow, tunnel or mine excavated by an •INSECT in plant tissues for feeding, •OVIPOSITION or shelter. •BARK BEETLE galleries are constructed in the inner •BARK, often etching the surface of the wood. Gallery form is characteristic for particular genera and for most •SPECIES.

general resistance •RESISTANCE to more than one •PEST or •DISEASE. The term is often used to mean resistance to all •RACES of a particular •PATHOGEN, but the term •RACE NONSPECIFIC RESISTANCE is considered preferable. See •FIELD RESISTANCE, •HORIZONTAL RESISTANCE.

generation 1. A group of offspring descended from common parents, or a group of parents. 2. The period of time between the birth of one generation and that of the next. 3. The period of time required to complete the •LIFE CYCLE of an organism from birth to reproduction. 4. All those individuals of an organism that are separated from a common parent or ancestor by an equal number of reproductive cycles.

genotype The genetic constitution of an individual as expressed in terms of selected heritable characters. Cf •PHENOTYPE.

germination 1. The beginning of growth of a mature, generally •DORMANT, •SEED, •SPORE or pollen grain. Generally characterized by the rupture of the seed coat, or of the spore or pollen-grain wall, and the emergence of a root, •SHOOT, thallus or •HYPHA. 2. The realization of •VIABILITY. In the field, germination is generally measured as the percent of seeds in a given sample that germinate and produce a seedling, regardless of subsequent seedling survival.

girdle To destroy the conducting •BARK tissues (•PHLOEM) all the way around a trunk, •STEM, branch or root, so that prevention of the movement of photosynthetic products causes the affected plant part to die. When the trunk is girdled, nutrient depletion may cause the roots to die, cutting off the water supply to the •CROWN, thus killing the top as well. Many deciduous trees once girdled can repair the damage and survive. Girdling may be produced by •BARK BEETLE or •WEEVIL activity, rodent gnawing or •FUNGAL •INFECTIONS, as well as deliberately as a way of killing unwanted trees.

girdler 1. An animal, usually an •INSECT, that in feeding or •MINING on or in a plant •GIRDLES the main or secondary stems. 2. A mechanical device used to •GIRDLE trees. See •MANUAL CONTROL.

gradual metamorphosis Type of •INSECT development in which immature •STAGES (•NYMPHS) resemble the •ADULT in general form and in which there is no •PUPAL stage preceding the adult. See •HEMIMETABOLOUS, •METAMORPHOSIS. Cf •COMPLETE METAMORPHOSIS, •HOLOMETABOLOUS, •INCOMPLETE METAMORPHOSIS.

grazing Feeding on grass or other herbage by cropping the edible parts of the plants. Controlled grazing by domestic livestock can be an effective tool in •VEGETATION MANAGEMENT under some circumstances. Cf •BROWSING.

green attack (= current attack) One of the 'attack codes' specified in the B.C. Ministry of Forests Cruising Manual for describing •CONIFERS infested by •BARK BEETLES. The foliage is still green, but •BORING DUST in •BARK crevices and/or •PITCH TUBES may be found on the •BOLE, and the inner bark contains beetles in characteristic egg, •LARVAL or pupal •GALLERIES. Cf •GREEN STRIP ATTACK, •GREY ATTACK, •RED ATTACK.

green (alive) strip attack One of the 'attack codes' specified in the B.C. Ministry of Forests Cruising Manual for describing •CONIFERS •INFESTED by •BARK BEETLES. Trees are infested in a strip on the lower •BOLE where •BROODS either failed or succeeded in completing their development, but the attack does not usually kill the tree. Cf •GREEN ATTACK, •GREY ATTACK, •RED ATTACK.

gregarious Said of a •SPECIES in which individuals tend to gather together in groups.

grey attack (= old attack) One of the 'attack codes' specified in the B.C. Ministry of Forests Cruising Manual for describing •CONIFERS infested by •BARK BEETLES. These trees have been dead for two or more years. Little or no foliage is left; the •BOLES of older kills may have much •CHECKING and loose •BARK. •PITCH TUBES on the bark of the lower bole and/or •GALLERIES under the bark may still be discernable. See •BLACK-TOP. Cf •GREEN ATTACK, •RED ATTACK.

grey-top See •BLACK-TOP.

gribble A wood-boring marine crustacean, in the genus *Limnoria*, damaging to wood pilings. Cf •TEREDO.

grid A systematically laid out group of observation or measurement points covering an entire •STAND or block, usually in the form of a series of squares or rectangles formed by equally spaced intersecting •TRANSECT lines perpendicular to baselines and at right angles to each other.

grid interval The fixed distance between •TRANSECT lines in a •GRID.

grid-probe A •STRIP-CRUISE (tallying of all •RED ATTACKED and •GREEN ATTACKED trees) within a pre-specified width on either side of a compassed line.

ground application Application of a •PESTICIDE from the ground, e.g. by backpack sprayer or ground fogger. Cf •AERIAL APPLICATION.

ground truthing Use of a ground •SURVEY to confirm the findings of an aerial survey, e.g. to •IDENTIFY the •PEST causing observed •DAMAGE or to calibrate quantitative aerial observations.

growth loss Reduced tree growth caused by harmful or destructive agents such as •INSECTS, •DISEASE, weather, etc.

growth regulator See •PLANT GROWTH REGULATOR, •INSECT GROWTH REGULATOR.

grub •BEETLE •LARVA, generally soft-bodied and rather thick.

grub out 1. To fell by exposing and cutting the roots. 2. To dig out.

guidelines Recommended methods or actions for administrative decision and operational implementation, e.g. comprised of B.C. Ministry of Forests Policy and Procedures and other relevant information.

gum 1. Non-volatile, viscous exudates from many plants and trees, composed of complex polysaccharides, which either dissolve or swell up on contact with water. Formed by plant cells in reaction to wounding or •INFECTION. 2. In industry, the term gum is used as a synonym, as in 'gum naval stores,' for •OLEORESIN obtained from living •CONIFEROUS trees and used as a raw material for the production of turpentine and rosin.

gummosis 1. Exudation of •GUM from a plant in response to adverse •ENVIRONMENTAL conditions, wounding or the presence of a •PATHOGEN. Cf •RESINOSIS. 2. Partial or complete destruction of cells, accompanied by the formation of •GUM, which occludes the newly formed cavity and occasionally the cells adjacent to it. See •WOUND GUM. Cf •RESINOSIS.

gymnosperm A member of one of the two major classes of •SEED-bearing plants, characterized by the production of seeds which are not enclosed in an ovary. See •CONIFER. Cf •ANGIOSPERM.

H

habit 1. (= growth form) The characteristic general appearance — shape, posture, and mode of growth, rather than size or color — of an organism. 2. The general form of arrangement of •STEM, roots, and branches, or of the entire plant, possessed in common by a given species in a given •HABITAT.

habitat The general place occupied by a particular organism in nature, considered in terms of all the •ENVIRONMENTAL influences acting upon it. See •NICHE.

hack and squirt A method of killing undesired trees by making one or several overlapping axe cuts into the •SAPWOOD to which liquid •HERBICIDE is applied. Cf •STUBBLING.

harvest Cutting or removal of physically mature or commercially valuable trees, in contrast to cuttings of immature trees or of those with no commercial value. Cf •STAND TENDING.

hazard 1. A potential adverse effect (e.g. poisoning of •NON-TARGET ORGANISMS), without reference to its probability. 2. •STAND, tree and •ENVIRONMENTAL characteristics which are conducive to a •PEST •OUTBREAK or •INFESTATION. Cf •RISK.

hazard rating A system of identifying and ranking individual •STANDS in terms of their vulnerability to a •PEST •INFESTATION or •OUTBREAK. Used to project the course of pest infestations, indicate potential losses, and assign priorities for •HARVESTING and remedial treatments. See •HAZARD.

heart rot A •DECAY characteristically confined to the •HEARTWOOD, often beginning in the living tree via •INFECTION of wounds or branch stubs.

heartwood The inner layers of wood which, in the growing tree, have ceased to conduct or to contain living cells, and in which the reserve materials (e.g. starch) have been removed or converted into more durable substances. Generally darker in color than •SAPWOOD, more durable, less easily attacked by •DECAY producing organisms, and less penetrable to •PRESERVATIVES and other liquids. With increasing age, heartwood loses water and stored food substances and becomes infiltrated with various organic compounds, such as •GUMS, •RESINS, and tannins. Cf •SAPWOOD.

hemimetabolous An •INSECT •LIFE cycle characterized by •INCOMPLETE •METAMORPHOSIS, with a distinct change in body form between immature and •ADULT •STAGES, as in dragonflies. Cf •HOLOMETABOLOUS.

herb Any seed-producing plant that does not develop persistent woody tissue above ground; includes both •FORBS and grasses.

herbicide (= •PHYTOCIDE) A •PESTICIDE used to •CONTROL or •MANAGE •WEEDS, i.e. unwanted •HERBS, •BRUSH, •SHRUBS or trees. Cf •ARBORICIDE.

heteroecious Requiring two or more unrelated •HOSTS (i.e. •ALTERNATE HOSTS) to complete its •LIFE CYCLE. Pertains particularly to •APHIDS and •RUST FUNGI. The opposite of •AUTOECIOUS. See •ALTERNATING GENERATIONS. Cf •DIOECIOUS, •MONOECIOUS.

hibernaculum Silken shelter or shelter made out of a leaf or other material in which an •INSECT •LARVA overwinters.

hibernation Passing the winter or cold season in a •DORMANT condition, reflecting greatly reduced metabolic activity; characteristic of certain mammals and deciduous plants. Cf •AESTIVATION, •DIAPAUSE, •DORMANCY.

hidden defect A •DEFECT in a log or tree that cannot be observed prior to milling.

hip canker A •CANKER on one side of the trunk of pine, partially or almost completely grown over, caused by Western •GALL •RUST, *Endocronartium harknessii*.

hold over 1. An •INDIVIDUAL of an •INSECT •BROOD which fails to •EMERGE at the normal time, as in late summer or fall, but which emerges later, e.g. in the following spring. 2. A tree from which a •BARK BEETLE •BROOD emerges later than normal. 3. A 'veteran' tree that has escaped logging, •WINDTHROW or fire, and currently occupies a •DOMINANT position in the •STAND. Cf •WOLF TREE.

holometabolous An •INSECT whose •LIFE cycle is characterized by •COMPLETE METAMORPHOSIS, in which there are egg, •LARVAL, •PUPAL and •ADULT •STAGES. See •METAMORPHOSIS. Cf •HEMIMETABOLOUS, •GRADUAL METAMORPHOSIS.

honeydew Sweet sticky fluid, derived from plant sap, and excreted by sucking •INSECTS, such as •APHIDS and •SCALES.

horizontal resistance (= race non-specific resistance) A type of •RESISTANCE, usually •POLYGENIC, in which the ranking of all •HOST •VARIETIES by degree of resistance (but not necessarily by the actual level of resistance) remains constant against all •PEST •GENOTYPES. Generally quantitative in effect, e.g. characterized by increased incubation times, decreased rate of •PATHOGEN reproduction, or slowed rate of spread of an •EPIDEMIC. Cf •VERTICAL RESISTANCE.

hormone A chemical secreted in trace amounts by cells in one part of an organism which exerts an effect on the activities of cells in another part of the organism. See •INSECT

GROWTH REGULATOR, •PLANT GROWTH REGULATOR.

host 1. The plant or animal on which an •INSECT feeds. 2. The organism on or in which a •PARASITE lives and obtains its food. 3. An organism which is attacked or •SUSCEPTIBLE to attack by a •PATHOGEN or •INSECT.

host range The various kinds of •HOSTS that a given •INSECT or •PARASITE may attack.

host selection (= tree selection) The location of a •SUSCEPTIBLE •HOST individual by a •PHYTOPHAGOUS or •ENTOMOPHAGOUS •INSECT. See •PIONEER BEETLE.

host specificity The degree to which a given organism is restricted to a particular type of •HOST. See •HOST range, •MONOPHAGOUS, •OLIGOPHAGOUS, •POLYPHAGOUS, •STENOPHAGOUS.

host susceptibility rating 1. A measure of the ability of a tree •SPECIES to resist attack by a particular •PEST. 2. A classification system describing •SUSCEPTIBILITY of various tree •SPECIES to •DWARF MISTLETOES, based on determination of an infection factor, i.e. the percent of trees of the species in question that are •INFECTED within 6 m of heavily infected •PRINCIPAL (main) HOSTS. Five host-susceptibility classes based on these infection factor percentages are:

- •PRINCIPAL HOST: The main host of a particular •TAXON. Infection factor is at least 90% and usually nearly 100%. Although some trees may show little infection within the 6 m zone, uninfected trees are seldom found unless they are very •SUPPRESSED. A dwarf mistletoe may have several principal hosts.
- •SECONDARY HOST: Infection factor ranges from 50-90%.
- •OCCASIONAL HOST: Infection factor ranges from 5-50%.
- •RARE HOST: Infection factor more than zero but less than 5%.
- •IMMUNE HOST (= non-host): Trees are not infected, even in stands where the dwarf mistletoe in question is common. Infection factor is zero.

Many undefined, subjective terms (such as 'common', 'principal', 'main', 'uncommon' or 'rare' hosts) have been used to describe relative susceptibility of trees to dwarf mistletoes. Host susceptibility rating provides a less subjective classification system.

hyperparasite (= secondary parasite) A •PARASITE that parasitizes another parasite.

hyperparasitism (= secondary parasitism; = hyperparasitization) The parasitization of one •PARASITE by another.

hyperplasia Enlargement or overgrowth due to increased cell division. Cf •HYPERTROPHY, •HYPOPLASIA.

hypertrophy Enlargement or overgrowth due to abnormal increase in sizes of cells. Cf •HYPERPLASIA, •HYPOPLASIA.

hypha (plural = hyphae) A fine, often branched, thread of •FUNGAL cells. Cf •MYCELIUM.

hypoplasia 1. The underdevelopment of cells, tissues or organs. Cf •HYPERPLASIA, •HYPERTROPHY. 2. The production of a subnormal number of cells. Cf •HYPERPLASIA.

I

identification The assignment of unidentified individuals or specimens into an established classification. Correct •PEST identification is an essential prerequisite to the adoption of an appropriate •MANAGEMENT strategy.

immigrant population A •POPULATION of •INSECTS in a particular locality which have arrived there by •DISPERSAL from another locality. Cf •RESIDENT POPULATION.

immune host See •HOST susceptibility rating for •DWARF mistletoe.

immunity The state of being exempt from •INFECTION by a given •PATHOGEN. Cf •RESISTANCE, •SUSCEPTIBILITY, •TOLERANCE.

immunization The development of induced •RESISTANCE to •DISEASE as a result of previous •INFECTION. Instances of such acquired •IMMUNITY or resistance in plants have been reported against some •BACTERIAL, •VIRAL and •FUNGAL •PATHOGENS.

impact 1. The individual adverse effects and/or net effect of a given •PEST on the economic and social value of all uses of a resource, e.g. a tree •SPECIES, forest type or •MANAGEMENT unit, and on the management schedules and operations designed to realize such value. Cf •DAMAGE. 2. The adverse effects of a •MANAGEMENT practice or technique on any organism, •COMMUNITY or ecological process. Usually referred to as environmental impact.

imperfect (fungus) A •FUNGUS placed by taxonomists in the •*FUNGI IMPERFECTI*.

incidence Number of occurrences of a given phenomenon, e.g. number of trees •INFECTED with •ROOT ROT or •DWARF MISTLETOE or •INFESTED with •BARK BEETLES in a particular •STAND. Cf •INTENSITY.

incipient decay An early stage of •DECAY in which discoloration of the wood may be the only visible •SYMPTOM. An initial phase of this stage, in which the wood is invaded but no visible change has occurred, is sometimes referred to as the invisible or hidden stage. See •DECAY.

incipient infection An •INFECTION which is actively developing but has not yet reached a stage at which it is apparent. Cf •LATENT INFECTION.

incompatibility The inability of substances, e.g. •PESTICIDES, as solutions, emulsions or suspensions, to mix without causing undesirable reactions, physical (e.g. coagulation, congealing, precipitation) or chemical (e.g. detoxification). Cf •COMPATIBLE.

incompatible host A tree that is •INFECTED by a •DWARF MISTLETOE but in which the development of the •PARASITIC relationship is abnormal. For example, marked swellings are frequently formed and there may be very few, or even no •SHOOTS produced. Incompatible •HOSTS are usually but not always 'rare hosts' (see •HOST SUSCEPTIBLITY RATING).

incomplete metamorphosis A type of •INSECT development in which there is no •PUPAL •STAGE, but the immature stages are distinctly different in body form from the •ADULT stage, as in dragonflies. See •HEMIMETABOLOUS, •METAMORPHOSIS. Cf •COMPLETE METAMORPHOSIS, •GRADUAL METAMORPHOSIS, •HOLOMETABOLOUS.

increment The increase in diameter, basal area, height, volume, quality or value of an individual tree or stand during a given period. See •MEAN ANNUAL INCREMENT.

increment(al) loss Loss of •INCREMENT in any form, often due to •PESTS. Cf •FORM DISTORTION LOSS, •MORTALITY LOSS.

incremental spraying A •PESTICIDE application method in which successive passes by a spray aircraft in a constant cross-wind results in a layering of deposits downwind, thus providing adequate coverage of the •TARGET area. See •DRIFT.

incubation period The period of time between penetration of a •HOST by a •PATHOGEN and the first appearance of •SYMPTOMS on the host. Cf •LAG PERIOD, •LATENT PERIOD.

incursion The usually predictable spread of a •PEST •INFECTION or •INFESTATION into an area of forest or range across a boundary from another land jurisdiction.

indicator plant 1. A plant that is considered representative of a particular •BIOGEOCLIMATIC ZONE, and thus by its presence indicates the zone. 2. (= indicator •HOST) A plant •SPECIES or •VARIETY which reacts to a particular •PATHOGEN or •ENVIRONMENTAL factor by the development of obvious •SYMPTOMS and is used to detect the presence of the pathogen or environmental factor.

indigenous •NATIVE to a particular area; naturally occurring; not •INTRODUCED. Cf •ENDEMIC.

indirect suppression •SUPPRESSION of a •PEST •POPULATION by altering •STAND or other conditions which favor it. For examples, see •SILVICULTURAL CONTROL, •SITE PREPARATION. Cf •DIRECT SUPPRESSION.

infected Said of a living organism successfully invaded by a •PATHOGEN or •PARASITE. Cf •INFESTED.

infected residual •INFECTED tree remaining after logging or a natural catastrophe (e.g. fire, windstorm). Usually refers to trees infected with •DWARF MISTLETOE. See •RESIDUAL.

infection 1. The entry of an organism or •VIRUS into a •HOST and the establishment of a •PARASITIC or a •PATHOGENIC relationship. 2. That process in which •DWARF MISTLETOES successfully penetrate host tissue and initiate establishment of the •ENDOPHYTIC SYSTEM. 3. The whole •MISTLETOE plant (•AERIAL SHOOTS and •ENDIPHYTIC SYSTEM) developing from a single •SEED, plus associated •HOST •SYMPTOMS. Also referred to as a 'plant'.

infection age Length of time since •INFECTION of a •HOST individual by a particular •PATHOGEN. Used particularly with reference to •DWARF MISTLETOE. Usually determined by counting the number of infected rings and adding one or two years to account for the period before •XYLEM STIMULATION.

infection center (= focus, = root disease pocket) A local concentration of •DISEASE, originating from one point of origin such as an •INFECTED stump. There is a characteristic distribution of infected trees: dead trees in the center, a fringe of recently killed trees, and infected but still living trees around the perimeter. The infection center gradually increases in radius as the •PATHOGEN spreads from tree to tree. This pattern is often seen in stands infected with •DWARF MISTLETOE or such •FUNGI as *Phellinus weirii* (•LAMINATED ROOT ROT). Cf •EPICENTER.

infection class A measure of •DWARF MISTLETOE •INTENSITY for individual trees. Cf •INFECTION RATING SYSTEM.

infection court 1. A suitable place for •INFECTION to occur, e.g. wounds, stomatal openings, etc. 2. The site of •INFECTION by a •PATHOGEN.

infection rating system A system for rating the •INTENSITY of attack by a •PEST. Individual trees are visually divided into portions (e.g. •STEM, top, middle and bottom •CROWN thirds, etc.), the degree of •INFECTION, •DEFOLIATION or other indication of attack is assessed for each portion, and the ratings for the portions are combined to give a rating for the tree as a whole. A •STAND is rated by taking the average of the ratings for individual trees within it. Cf •SIX CLASS SYSTEM.

infectious 1. Capable of causing an •INFECTION. 2. Referring to a •DISEASE caused by a •PATHOGEN which can spread from a diseased to a healthy •HOST.

infective 1. Able to attack a living organism and cause •INFECTION. The term is often qualified, as 'weakly infective,' 'strongly infective,' etc. 2. Said of a •VECTOR carrying a •PATHOGEN and capable of transferring it to a •HOST and causing •INFECTION.

infestation 1. •PEST •OUTBREAK widely and evenly distributed over a given area. 2. Occurrence of one or more •PEST •SPECIES in an area or location where their numbers and •IMPACT are currently or potentially at intolerable levels. 3. A condition in a •STAND in which one or more trees are •INFECTED with •DWARF MISTLETOE.

infested 1. Said of an area, organism, group of organisms or non-living •SUBSTRATE harboring great numbers of •INSECTS, •MITES, •NEMATODES, •WEEDS or •PATHOGENS. Cf •INFECTED. 2. Said of an area or field containing a •PATHOGEN in such density as to constitute a •DISEASE •HAZARD.

injury Damage of a plant by an animal or by a physical or chemical agent, i.e. the result of a particular event. Cf •DISEASE.

inoculation 1. The deliberate introduction of material containing or believed to contain living or killed organisms, generally •MICROORGANISMS, into a new •ENVIRONMENT, e.g. into soils, •CULTURE media or another living organism. 2. Deliberate placement of a •PATHOGEN in contact with or inside a •HOST, e.g. in order to test •PATHOGENICITY.

inoculative release Periodic, e.g. yearly, release of a •NATURAL ENEMY of a •PEST, to replenish a •POPULATION which is severely reduced by unfavorable conditions at certain times but operates effectively against the •TARGET pest through the rest of the year. See •BIOLOGICAL CONTROL. Cf •INUNDATIVE RELEASE.

inoculum 1. The •PATHOGEN or that portion of it (tissue, •SPORES, fragments of •MYCELIUM, etc.) which initiates •INFECTION of the •HOST. 2. Material containing •MICROORGANISMS or •VIRUS particles to be deliberately introduced into a •HOST or •CULTURE medium.

inoculum potential 1. The energy of growth of a •PATHOGEN available for •INFECTION of the •HOST at the surface of the host organ to be affected. 2. Density of •INOCULUM, made up of units having certain degrees of •VIRULENCE and vigor, as affected by •ENVIRONMENTAL factors. Inoculum potential is thus one of the components which determine whether •INFECTION will be successful in a particular situation.

insect A member of the arthropod class Insecta, characterized by possession of a body divided into three segments, bearing three pairs of legs on the •THORAX in the •ADULT •STAGE and one pair of segmented antennae on the head.

insect growth regulator (igr) 1. An •INSECT •HORMONE which controls growth, •MOULTING, and/or maturation from •PUPAL •STAGE to •ADULT. 2. A chemical substance used as a •PESTICIDE which disrupts the action of •INSECT •HORMONES controlling such processes as •MOULTING and maturation from •PUPAL STAGE to •ADULT. Cf •ECDYSOID, •JUVENOID.

insecticidal soap A soap (i.e. a formulation of fatty acid alkali salts) in which the length and degree of saturation of the fatty acid chains render the material relatively •TOXIC to •INSECTS and relatively non-toxic to plants. When used operationally, soaps must be •REGISTERED as •PESTICIDES.

insecticide A •PESTICIDE used to •CONTROL or •MANAGE •INSECTS.

insectivorous •INSECT-eating, usually applied to vertebrates. Cf •ENTOMOPHAGOUS.

instar 1. The form assumed by an •INSECT during a particular •STADIUM, i.e. any post-egg •STAGE initiated and/or terminated by •ECDYSIS. There are •LARVAL or •NYMPHAL instars, a •PUPAL instar and an •ADULT instar. 2. The •STAGE between •MOULTS of an •INSECT •LARVA, numbered to designate the various periods: e.g. the first instar is the stage between the egg and first larval moult. Cf •STADIUM.

integrated pest management A •PEST MANAGEMENT system that, in the context of specific resource management objectives and a knowledge of the associated •ENVIRONMENT and the •POPULATION DYNAMICS of the •PEST •SPECIES, utilizes all suitable techniques and methods in as compatible a manner as possible and attempts to maintain the pest populations at levels below those causing economically or socially unacceptable levels of •DAMAGE or prevents them from causing such •DAMAGE. Cf •PEST CONTROL, •PEST MANAGEMENT.

intensification Increase in numbers of a •PEST species in a particular locality or •STAND.

intensity Degree of attack of an individual or •STAND by a given •PEST. See •ATTACK INTENSITY RATING. Cf •INCIDENCE.

intercellular Between or among •HOST cells. Cf •INTRACELLULAR.

intermediate decay A stage of •DECAY in which some break-down of the normal wood structure is inevitable, but which does not yet present the characters of the •ADVANCED stage of decay. Cf •DECAY.

intermediate (trees) In an even-aged group or •STAND of trees, trees shorter than those in the •DOMINANT or •CO-DOMINANT classes, with •CROWNS either below or extending into the crown cover formed by these taller trees. See •CROWN CLASS. Cf •SUPPRESSED.

internode 1. The region of a plant •STEM between any two nodes, i.e. the areas at which leaves are attached. Buds are commonly borne at nodes, in the axils of leaves, i.e. the upper angles between leaves and stem. 2. In forestry, the distance between successive terminal buds in a •SHOOT or branch, which is often assumed to represent one year of growth in height or length. The distance between successive whorls of branches is commonly taken to be an internode in this sense; such usage may lead to incorrect measurements, since more than one whorl of branches may be produced in a given year.

intersection length The length of that portion of a •TRANSECT line through a •STAND which passes through a •ROOT ROT •INFECTION CENTER. See •INTERSECTION LENGTH METHOD.

intersection length method Estimation of the total area of •ROOT ROT •INFESTATION within a stand by determining the linear proportion of one or more straight •TRANSECT lines which pass through •INFECTION CENTERS.

interspecific Between •SPECIES; between individuals of different species. Cf •INTRASPECIFIC.

intracellular Within •HOST cells. Cf •INTERCELLULAR.

intraspecific Within a •SPECIES; between individuals of the same species. Cf •INTERSPECIFIC.

introduced organism Organism transferred, either accidentally or purposefully, from its •NATIVE area to another area.

inundative release The release over a defined area of large numbers of a •NATURAL ENEMY, (especially a •PARASITOID such as *Trichogramma*), of a •PEST, especially an •INSECT. It is not expected that the released organism will become •ESTABLISHED permanently, or that it will affect subsequent •GENERATIONS of the •TARGET pest. See •BIOLOGICAL CONTROL, •BIOLOGICAL INSECTICIDE. Cf •INOCULATIVE RELEASE.

invasion 1. The •PENETRATION and •COLONIZATION of a •HOST by a •PARASITE or •PATHOGEN. 2. The spread of a range •WEED or of •DWARF MISTLETOE into a previously uninfested area or •STAND.

isolate 1. To separate a •MICROORGANISM from its •SUBSTRATE and bring it into pure •CULTURE. 2. A single •SPORE, or a •CULTURE made by direct •ISOLATION from an •INFECTED •HOST or other natural •SUBSTRATE, and the subcultures derived from it. 3. Term used to indicate collections of a •PATHOGEN made at different times.

isolation 1. Process of placing an organism in pure •CULTURE, i.e. on laboratory culture medium without any other •MICROORGANISMS. 2. Separation of a •PATHOGEN from its •HOST, followed by •CULTURE on a nutrient medium.

J

juvenile hormone (= jh) •INSECT •HORMONE which determines the life •STAGE which will follow a given •MOULT; high levels of JH maintain juvenile stages, low levels interact with the growth and moulting hormone, •ECDYSONE, to allow the change to •PUPAL or •ADULT form.

juvenoid (= juvenile hormone analog, jha) Synthetic or botanical chemical which mimics •JUVENILE HORMONE action, and can thus be used as an •INSECTICIDE.

K

kairomone An •INTERSPECIFIC •SEMIOCHEMICAL that induces a response favorable to the perceiving •SPECIES. See •ALLELOCHEMIC. Cf •ALLOMONE, •PHEROMONE, •SYNOMONE.

klendusity Failure of a •SUSCEPTIBLE •HOST to become •INFECTED in the presence of a •PATHOGEN because it possesses characteristics which prevent or interfere with the activities of the •VECTOR of that pathogen.

knock-down 1. The immediate mortality of a •TARGET •PEST following the application of a •PESTICIDE. 2. To fell or remove •INFECTED RESIDUALS, e.g. for •DWARF MISTLETOE •CONTROL.

L

L.C. 50 (= median lethal concentration) A statistic indicating the degree of •TOXICITY of a •PESTICIDE or other substance when dissolved in a solvent (e.g. water) or as a vapor in air. Expressed as concentration in parts per million of •TOXICANT in air or solvent sufficient to kill 50% of the animals in a test •POPULATION exposed for a standard period of time, usually 96 hours. Used to express toxicity to •NON-TARGET ORGANISMS, as well as towards •TARGET •PESTS. The lower the L.C. 50, the more •TOXIC the material.

L.D. 50 (= median lethal concentration) A statistic indicating the degree of •TOXICITY of a •PESTICIDE or other substance. Expressed as mg per kg of body weight sufficient to kill 50% of the animals in a test •POPULATION. Used to express toxicity to •NON-TARGET ORGANISMS, as well as towards •TARGET •PESTS. An acute L.D. 50 is determined on the basis of single oral doses of the material in question, whereas a

chronic L.D. 50 is determined by administering daily doses over a lengthy period of time. The lower the L.D. 50, the more •TOXIC the material.

laminated root rot See •LAMINATION.

lamination •DECAYED wood separating readily along growth rings, characteristic of •INFECTION by *Phellinus weirii*.

larva (plural = larvae) In •INSECT •SPECIES which undergo complete •METAMORPHOSIS, an individual that emerges from the egg and differs fundamentally from the subsequent •PUPAL and •ADULT forms.

latent infection An established •INFECTION that gives no sign of its presence, remaining viable but inactive.

leader The terminal, i.e. the current year's topmost •SHOOT on the main •STEM; characteristic of the growth of certain plants and trees, especially •GYMNOSPERMS.

leaf miner An •INSECT that lives and feeds as a •LARVA within the inner tissues of leaves or needles. See •MINE, •NEEDLE MINER.

leaf roller An •INSECT that rolls the leaf of a plant and lives inside the roll. Usually •MOTH •LARVAE in the family Tortricidae.

leaf spot A self-limiting, often circular, •NECROTIC •LESION on a leaf.

leaf scorch •NECROSIS, usually at leaf tip or margins, often due to nutrient imbalance or •PHYTOTOXICITY of a •PESTICIDE or other chemical. Cf •SUNSCALD.

lesion An area of diseased or dead tissue which is localized, i.e. of definite extent.

life cycle 1. Series of changes in form (i.e. •STAGES) through which an organism develops from •SPORE or fertilized ovum to the •SPORE or fertilized ovum of the next •GENERATION. 2. Length of time taken by a given organism to go through this set of changes.

life table Tabulation of mortality factors acting on the various stages of an •INSECT •POPULATION, which displays the changing density of the affected population through time for a given place. When coupled with information about •FECUNDITY, can be used to predict the size of a succeeding •GENERATION.

lignin A complex non-carbohydrate organic substance produced by plants, which imparts rigidity and strength, especially to woody tissues.

localized infection (= local infection) An •INFECTION involving only a limited part of the •HOST. Cf •SYSTEMIC.

log stain A •STAIN present in the log before it is sawn into lumber.

looper (= inch worm) •LARVAL •STAGE of some Lepidoptera, usually geometrid •MOTHS, which have some of the •ABDOMINAL legs missing, causing the back to arch in a loop when moving. Loopers are further characterized by fast backward movement when touched.

M

m.a.i. See •MEAN ANNUAL INCREMENT.

maggot •LARVAL form of •FLIES, and some wasps, with neither legs nor a well-defined head.

main host See •HOST SUSCEPTIBILITY RATING for •DWARF MISTLETOE.

management See •FOREST MANAGEMENT, •PEST MANAGEMENT. Cf •CONTROL.

manual control The use of chainsaws, axes, brushcutters, girdling tools and other hand-held equipment to reduce •PEST, especially •WEED and •BRUSH, •POPULATIONS. Cf •BIOLOGICAL CONTROL, •CHEMICAL CONTROL, •MECHANICAL CONTROL.

masked symptoms 1. The condition whereby a •HOST is •INFECTED but does not exhibit •DISEASE •SYMPTOMS because the •ENVIRONMENT is not favorable for disease development and/or expression. 2. •VIRUS-induced plant •SYMPTOMS that are absent under certain •ENVIRONMENTAL conditions but appear when the •HOST is exposed to certain conditions of light and temperature.

mass attack The •AGGREGATION of •BARK BEETLE •ADULTS on one •HOST tree in sufficiently large numbers to overcome the host's defense mechanisms against them.

mass trapping (= trapping out) Use of •BAITED traps, trees or logs to attract large numbers of a •PEST •SPECIES in an attempt to reduce significantly the size of the breeding •POPULATION of the pest in a given area, and thus reduce subsequent •DAMAGE.

mean annual increment (= m.a.i.) The average annual •INCREMENT of an individual tree, •STAND, or larger forest unit, calculated as the total volume per hectare divided by the age of the tree or stand.

mechanical control Use of mechanized equipment for •PEST management, especially in •SITE PREPARATION and •VEGETATION MANAGEMENT in young plantations. Cf •BIOLOGICAL CONTROL, •CHEMICAL CONTROL, •MANUAL CONTROL.

merchantable 1. Of a tree or •STAND that has attained sufficient size, quality, and/or volume to make it suitable for •HARVESTING under given economic conditions, even if so situated as not to be immediately accessible for logging. Cf •UNMERCHANTABLE. 2. Of a •BOLE or •STEM, the part suitable for sale.

merchantable height 1. The height above ground, to which a tree •STEM is saleable. 2. The vertical distance between ground level and a point on the standing tree having a specified •UTILIZATION LIMIT, which is expressed in terms of diameter inside •BARK.

meristem In plants, a region of active cell division. The source of cells that will intiate and differentiate into specialized tissues, e.g. •PHLOEM, •XYLEM. Some of the products of cell division remain •MERISTEMATIC in character, so that the meristem may persist indefinitely. See •APICAL MERISTEM, •CAMBIUM, •PERIDERM.

meristematic cell In plants, a cell which by dividing functions as a source of other cells. See •MERISTEM.

metamorphosis Change in an animal's form during development from egg to •ADULT; in •INSECTS, may be either •COMPLETE, •GRADUAL or •INCOMPLETE. See •HEMIMETABOLOUS, •HOLOMETABOLOUS.

microbial pesticide A •PESTICIDE in which the •ACTIVE INGREDIENT is a •MICROORGANISM, e.g. a •VIRUS or a •BACTERIUM, such as •*BACILLUS THURINGIENSIS*, which is applied in a manner analogous to that used for a conventional •PESTICIDE to control an existing •PEST •POPULATION.

microorganism An organism too small to be seen with the unaided eye, e.g. •VIRUS, •BACTERIUM, protozoan, mold, yeast, •FUNGAL •HYPHA.

mine Tunnel eaten through leaf or other plant tissues by an •INSECT •LARVA. See •LEAF MINER, •NEEDLE MINER.

minor use registration A special program of Agriculture Canada for •REGISTRATION of •PESTICIDE uses for which anticipated sales volumes are not sufficient to pusuade the manufacturer to carry out all the research usually required for registration of a new use. The pesticide in question must already be registered under the •PEST CONTROL PRODUCTS ACT, and the new use must be for a

crop or •PEST for which adequate pesticides are not already registered. •EFFICACY, crop •TOLERANCE and environmental acceptability must be demonstrated for a minor use permit to be granted. Since in many cases a needed forestry use does not represent a major market for a pesticide, Minor Use Registration can be an important route for obtaining registration for pesticides to be used in forestry.

mistletoe A flowering plant, belonging to the family Loranthaceae, which is •PARASITIC on trees and other woody plants. See •DWARF MISTLETOE.

mite A member of the order Acarina in the class Arachnida (the class of arthopods to which spiders belong), characterized by small size and the lack of obvious division of the body into head and •THORAX. Some •SPECIES, e.g. spider mites, may be serious forest •PESTS, while others are beneficial •PREDATORS.

mobility The ease with which a substance, e.g. a •PESTICIDE, moves along with water through or over the soil.

monitoring 1. Periodic determination by •SAMPLING of the presence and density of a •PEST •POPULATION at a given place, in order to determine whether treatment is required. 2. Assessment of the presence and level of any agent, e.g. a •PESTICIDE, in the •ENVIRONMENT.

monoecious Having male and female reproductive structures in different flowers on the same plant. The opposite of •DIOECIOUS. Cf •AUTOECIOUS, •HETEROECIOUS.

monogenic resistance •RESISTANCE controlled by one gene. Cf •OLIGOGENIC RESISTANCE, •POLYGENIC RESISTANCE.

monophagous Highly restricted in feeding habits, making use of only one genus or •SPECIES of •HOST. See •HOST RANGE, •HOST SPECIFICITY. Cf •OLIGOPHAGOUS, •POLYPHAGOUS, •STENOPHAGOUS.

mortality loss Loss of timber due to death of trees. Cf •FORM DISTORTION LOSS, •INCREMENT(AL) LOSS.

moth A member of one of the major divisions of the •INSECT order Lepidoptera, distinguished from •BUTTERFLIES by •ADULT forms with stouter bodies, duller and proportionately smaller wings, feathered or filamentous rather than clubbed antennae, and usually •NOCTURNAL or •CREPUSCULAR in habit. The Lepidoptera are characterized by •COMPLETE METAMORPHOSIS, adults with four membraneous wings largely covered with scales, a long, coiled proboscis and slender, sometimes feathery antennae. •LARVAE are called •CATERPILLARS.

moult In •INSECTS, a transition process in which the inner •CUTICLE (endocuticle) is digested, the old epi- and exocuticle are shed (•ECDYSIS) and new cuticle is formed.

multiple leaders Forked growth, with two or more •LEADERS. Often the result of •INSECT or other •INJURY to the original leader.

multiple parasitism The simultaneous •INFESTATION of an individual •HOST by two or more •SPECIES of •PRIMARY PARASITES. Cf •HYPERPARASITE, •SUPERPARASITISM. See •PARASITOID.

multiple (resource) use The compatible, simultaneous utilization of two or more natural resources on a given land area, e.g. timber production and recreation.

multivoltine Condition in which an animal •SPECIES, e.g. an •INSECT or •NEMATODE, produces many •BROODS or generations in a single year or season. Cf •BIVOLTINE, •UNIVOLTINE.

mutualism A relationship in which two or more different organisms live together to the benefit of each. •MUTUALISM — •COMMENSALISM — •PARASITISM may be viewed as a continuum, without sharp boundaries between these qualities of relationship. See •SYMBIOTIC.

mycangium (plural = mycangia) Specialized pocket found in the •EXOSKELETONS of •AMBROSIA BEETLES, some •BARK BEETLES, and other •INSECTS, which contain •SYMBIOTIC •FUNGI. Cf •MYCETOME.

mycelial fan Fan-shaped mass of •HYPHAE, formed between •BARK layers or between bark and wood of trees. Often found near the base of trees infected with *Armillaria* •ROOT ROT. Cf •MYCELIAL PLAQUE.

mycelial plaque (= mycelial pad) A small, thin felt of •HYPHAE, in other than a fan-shaped pattern, formed between •BARK layers or between bark and wood of trees. Cf •MYCELIAL FAN.

mycelial strand A water conducting structure of certain •FUNGI (e.g. *Poria incrassata*), formed by the coalescence of several •HYPHAE. See •DRY ROT. Cf •RHIZOMORPH.

mycelium The •VEGETATIVE part of a •FUNGUS, composed of interwoven •HYPHAE, usually considered as distinct from the •FRUITING BODY.

mycetome In •INSECTS, an aggregation of specialized cells surrounding •SYMBIOTIC •MICROORGANISMS. Cf •MYCANGIUM.

mycorrhiza A rootlet of a higher plant modified through integral association with a •FUNGUS to form a constant structure which differs from either component but is attached to the root system and functions somewhat as a rootlet. It is usually considered to be beneficial to the associated plant. May be characterized as •ECTENDOTROPHIC, •ECTOTROPHIC, or •ENDOTROPHIC.

N

NSR See •NOT SATISFACTORILY RESTOCKED.

naiad Aquatic •NYMPH, e.g. of a dragonfly or damselfly.

native 1. = •INDIGENOUS. 2. Said of an area or •HABITAT in which a particular organism is •INDIGENOUS.

natural enemies The •PARASITES, •PARASITOIDS, •PREDATORS and •PATHOGENS associated in nature with a specific wild •POPULATION of plants or animals.

necrosis The death or disintegration of cells or tissues while still part of a living organism; in plants usually results in a darkening of the affected tissue. Cf •DECAY.

necrotic Showing signs of •NECROSIS; dead.

needle cast 1. Premature dropping of needles in •CONIFEROUS trees, often in May or June. Frequently associated with attack by certain •ASCOMYCETE •FUNGI, but sometimes caused by •NON-INFECTIOUS agents. 2. A •DISEASE characterized by this •SYMPTOM.

needle miner An •INSECT that lives and feeds as a •LARVA within the inner tissues of •CONIFEROUS needles. See •LEAF MINER, •MINE.

nematocide A •PESTICIDE used to •CONTROL or •MANAGE •NEMATODES.

nematode An unsegmented roundworm: tiny to microscopic; usually but not always, threadlike; •FREE-LIVING or •PARASITIC. •INSECT-attacking nematodes may be beneficial •PARASITES of forest •INSECT •PESTS, particularly subcortical and soil-inhabiting insects, and may be used as •BIOLOGICAL •INSECTICIDES. Plant-attacking nematodes may cause •DAMAGE and •DISEASE by feeding on, or in, roots or other plant parts, may induce root-knots on fine feeder roots of trees or seedlings, or act as •VECTORS of •VIRUSES, •FUNGI or

other •PATHOGENIC •MICROORGANISMS.

niche The ecological role of a •SPECIES in a •COMMUNITY. In ecological terminology, this term does not refer to the physical •HABITAT, or microhabitat, occupied by an organism.

nocturnal Active during the night.

noninfectious disease (= •DISORDER, = •ABIOTIC disease) A •DISEASE that is caused by an •ENVIRONMENTAL factor rather than by an •INFECTIOUS agent which can be passed from one •HOST to another.

nonpathogenic Incapable of inducing •DISEASE. See •PATHOGENICITY. Cf •NON-VIRULENT.

nonselective herbicide A chemical that is generally •TOXIC to plants without regard to •SPECIES. Specificity of treatment may be then be achieved by dosage, method of application, timing of •APPLICATION, etc. See •APPLICATION (TIMING OF). Cf •SELECTIVE HERBICIDE.

non-systemic infection 1. A •LOCALIZED, or local, •INFECTION. 2. A •DWARF MISTLETOE •INFECTION in which the •ENDOPHYTIC SYSTEM is generally restricted to the swollen portion of the •HOST.

non-target organism An organism, including human, which is not a •PEST, and against which no action is intended, but which is likely to be exposed to a •PESTICIDE applied against another organism.

non-virulent (= avirulent) Nonpathogenic. Describes a variant of a •PATHOGENIC organism which is incapable of inducing severe •DISEASE. See •PATHOGENICITY. Cf •NONPATHOGENIC.

not satisfactorily restocked (= NSR) A term applied to the backlog of forest land which has not been effectively managed after harvesting and hence is insufficently •STOCKED and/or has become occupied by undesirable •SPECIES.

notching 1. A type of •GIRDLING in which the tree is ringed with notches cut well into the •SAPWOOD. 2. Making a series of close downward and upward, i.e. V-shaped, incisions into the •SAPWOOD. Cf •FRILL GIRDLING, •GIRDLING.

nuclear polyhedrosis virus (npv) A •PATHOGEN of •INSECTS, mainly •LARVAE of certain Lepidoptera and Hymenoptera, characterized by the formation of polyhedral bodies in the nuclei of infected cells. Some strains of such •VIRUSES are in use as •MICROBIAL PESTICIDES.

nuptial chamber A chamber excavated by certain •BARK BEETLES under the •BARK of the •HOST tree, in which mating takes place.

nuptial flight Mating flight, used most commonly in reference to bees, ants and termites.

nursery stock Tree seedlings being grown in a nursery for transplantation elsewhere.

nymph Immature •STAGE of an •INSECT which undergoes •INCOMPLETE METAMORPHOSIS; resembles the •ADULT except for incomplete wing and gonad development.

O

obligate parasite A •PARASITE that in nature cannot complete its development away from its living •HOST. Cf •FACULTATIVE PARASITE.

oblique aerial photograph A photograph taken with the camera axis intentionally directed between the horizontal and the vertical. Cf •VERTICAL AERIAL PHOTOGRAPH.

occasional host See •HOST SUSCEPTIBILITY RATING for •DWARF MISTLETOE.

oleoresin A type of viscous, soft •PITCH consisting of a mixture of monoterpenes (e.g. turpentine), resin acids, plant sterols and other neutral components. The mixture is secreted by the •RESIN-forming cells of pines and certain other •CONIFEROUS and broad-leaved trees. When resin canals are severed by •BARK BEETLES, oleoresin exudation results in •PITCH TUBES and sometimes •PITCHING-OUT of the attacking beetles. See •RESINOSIS.

oligogenic resistance •RESISTANCE controlled by a few genes, the •PHENOTYPIC effect of which may be large or small. See •VERTICAL RESISTANCE. Cf •MONOGENIC RESISTANCE, •POLYGENIC RESISTANCE.

oligophagous Somewhat restricted in feeding habits, making use of only a few kinds of •HOSTS. See •HOST RANGE, •HOST SPECIFICITY. Cf •MONOPHAGOUS, •POLYPHAGOUS, •STENOPHAGOUS.

operational trial A relatively extensive field test of a technological innovation, such as a piece of equipment, a •PESTICIDE, or a •MANAGEMENT procedure, in which the scale of the test is large enough for the innovation's performance and convenience in actual use to be assessed. Cf •PILOT PROJECT.

opportunity cost The cost of using financial or other resources for a particular purpose, measured by the benefit or revenues given up by not using them in their best (i.e. most profitable or productive) alternative use. Such costs must be taken into account when calculating the benefits of a given •PEST MANAGEMENT strategy. See •BENEFIT-COST ANALYSIS.

outbreak A sudden increase in destructiveness or •POPULATION level of a •PEST •SPECIES in a given area. Usually used in reference to •INSECTS. Cf •INFESTATION.

overwintering brood The •BARK BEETLE •BROOD which passes the winter inside the •HOST tree, completing development in the spring.

overwintering stage The •STAGE in which an organism, e.g. •INSECT or •FUNGUS, endures the adverse conditions of winter.

oviposition Laying of eggs.

ovipositor 1. Egg-laying organ. 2. In female •INSECTS, the tubular or valved structure by means of which the eggs are placed; usually a protrusible organ normally concealed within the body, but sometimes permanently extended far beyond the end of the body.

P

palatability The relative attractiveness of a potential food source to a •PREDATOR or herbivore.

pandemic An •EPIDEMIC that occurs over an extended geographical area, or, especially, one that occurs simultaneously in many parts of the world.

parasite An organism that, for at least part of its life cycle, lives on or in, and at the expense of, another living organism, often obtaining nutrients from its tissues. A parasite needs only one or part of one •HOST individual to reach maturity or to complete a particular stage of development. The terms •PATHOGEN and parasite are not interchangeable: 'parasite' refers to an organism's mode of life, while 'pathogen' refers to its ability to cause •DISEASE. Not all parasites are pathogens and not all pathogens are parasites. See •PARASITISM, •PARASITOID, •SYMBIOTIC. Cf •EPIPHYTE, •FACULTATIVE PARASITE, •OBLIGATE PARASITE, •PREDATOR, •SAPROPHYTE.

parasitism The relationship between a •PARASITE and its •HOST. •MUTUALISM — •COMMENSALISM — •PARASITISM may be viewed as a continuum, without sharp boundaries

between these qualities of relationship. See •SYMBIOTIC.

parasitoid An •INSECT which in its •LARVAL •STAGE is •PARASITIC on another •INSECT, destroying its •HOST in the process of its development; the •ADULT stage is •FREE-LIVING.

parent adult Sexually mature •INSECT that has produced young, particularly a •BARK or •AMBROSIA BEETLE which has produced one •BROOD and may again attack trees or logs.

pathogen Any agent, whether a living organism or •ABIOTIC agent, that induces •DISEASE.

pathogenicity The capacity to cause •DISEASE. May be qualified, e.g. as 'high,' 'moderate,' or 'low,' but the term •VIRULENCE is preferable for indicating the degree to which a •PATHOGEN is able to induce disease. Pathogenicity may be used to describe a group of organisms, such as a genus or •SPECIES, while virulence is used to describe the ability of a particular •ISOLATE, •STRAIN or other subgroup to cause disease under particular conditions. It is thus possible to refer to a •NON-VIRULENT strain of a pathogenic organism.

pathological rotation age The maximum •ROTATION AGE through which a •STAND of trees may be grown without significant volume loss from •DISEASE, i.e. the stand age at which annual volume loss from disease equals annual volume •INCREMENT.

pathology 1. The scientific study of •DISEASE, including diseases caused by •VIRUSES, •BACTERIA, mycoplasmas and •FUNGI and, often, •NEMATODES. •INJURY caused by •INSECTS and other animals is usually excluded. •DISORDERS of plants due to •ABIOTIC factors are frequently but not always considered to be within the sphere of plant pathology (= phytopathology). 2. The profession of such study.

pathotype See •BIOTYPE (2).

penetration Initial invasion of the •HOST by a •PARASITE or •PATHOGEN, through natural openings such as stomata or lenticels, through wounds, or directly through intact host tissues. Cf •COLONIZATION, •INVASION.

perennial canker A •CANKER in which the usually intermittent activity of a •PATHOGEN or other injurious factor and the •HOST'S responses over a period of years prevent complete healing.

periderm A protective tissue usually formed around the outside of woody •STEMS. Periderm may also form around aerial roots, around diseased or wounded tissues within the plant, and beneath the surface of wounds. It consists of three parts: the cork •CAMBIUM (phellogen); the •CORK (phellem), a layer mostly consisting of dead cells formed to the outside of the cork cambium; and the phelloderm, formed to the inside of the cork cambium. See •BARK.

perithecium A globe or flask-shaped •FRUITING BODY, produced by certain •ASCOMYCETE fungi, with an opening or pore (ostiole) through which the •ASCOSPORES are discharged. Cf •APOTHECIUM.

persistence The tendency of a •PESTICIDE to remain biologically active over a period of time after application, due to chemical stability and low •VOLATILITY.

pest 1. Any organism or damaging agent designated as detrimental to effective resource management. Pests include certain •INSECTS, •MITES, •FUNGI, •BACTERIA, •VIRUSES, •NEMATODES, plants and vertebrates. 2. Any organism or •POPULATION of organisms (other than •MICROORGANISMS causing •DISEASE in humans, pets or livestock) which thwarts or constrains resource •MANAGEMENT objectives or causes significant harm to people or loss to their property, or is at least perceived as doing so. 3. In the Federal •PEST CONTROL PRODUCTS ACT: "Any injurious, noxious or troublesome •INSECT, •FUNGUS, •BACTERIAL organism, •VIRUS, •WEED, rodent or other plant or animal pest, and includes any injurious, noxious or troublesome organic function of a plant or animal."

pest control 1. Reduction of resource losses or •PEST occurrences to an acceptable level by direct and immediate application of approved strategies or techniques. Cf •PEST MANAGEMENT. 2. Regulation of •PEST •POPULATIONS, to levels below those at which they cause unacceptable harm, by human intervention including the use of chemical, physical and/or •BIOTIC agents. Control, as distinguished from management, often carries the implication of bringing about increased mortality in the •POPULATION in question. Cf •PEST MANAGEMENT.

pest control device In the Regulations under the •PEST CONTROL PRODUCTS ACT, "any article, instrument, apparatus, contrivance or gadget that, by itself or in conjunction with a •CONTROL PRODUCT, is used as a means to •CONTROL a •PEST directly or indirectly." Examples are •PHEROMONE-•BAITED traps and mousetraps.

pest control product In the federal •PEST CONTROL PRODUCTS ACT: "Any product, •DEVICE, organism, substance or thing that is manufactured, represented, sold or used as a means for directly or indirectly controlling, preventing, destroying, mitigating, attracting or repelling any •PEST, and includes (a) any compound or substance [e.g. a •SYNERGIST] that enhances or modifies or is intended to enhance or modify the physical or chemical characterisitics of a control product to which it is added, and (b) any •ACTIVE INGREDIENT used for the manufacture of a control product." See •PESTICIDE, •REGISTERED PESTICIDE.

Pest Control Products Act (P.C.P. Act) A Federal Act administered by Agriculture Canada. The Act provides that, in order to be registered for sale or use in Canada, a •PESTICIDE (•PEST CONTROL PRODUCT) must be supported by evidence of safety and effectiveness for the purposes claimed. The pesticide must be accurately labelled as to composition and •HAZARDS. The seller must also provide adequate directions for use. Each •REGISTERED PESTICIDE is given a P.C.P. number, which must appear on the label.

pest management 1. The application of approved strategies to control or prevent •PEST •INFESTATIONS and •DAMAGE. Pest management strategies and tactics include: (1) long term management to protect forest and range resources, (2) comprehensive •SILVICULTURAL and harvesting operations, and (3) pest-specific suppression methods. Cf •PEST CONTROL. 2. The management of any •ECOSYSTEM, by or as recommended by professional pest managers, on the basis of information, and at acceptable cost, with the dual objectives of preventing or controlling •PEST-caused harm or loss and avoiding harm to useful organisms. Pest management is one component of overall •FOREST MANAGEMENT, and includes development and implementation of long-term strategies for maintaining pest populations at levels below those causing economically or socially unacceptable •DAMAGE to the resource. Cf •INTEGRATED PEST MANAGEMENT, •PEST CONTROL.

pesticide Any substance or mixture of substances of biological or synthetic origin or preparation of •MICROORGANISMS, other than a device, intended for killing, controlling or managing one or more •PESTS. See •BIOLOGICAL PESTICIDE, •MICROBIAL PESTICIDE, •PEST CONTROL DEVICE, •PEST CONTROL PRODUCT, •REGISTERED PESTICIDE, •REPELLANT.

pesticide applicator An individual who has been certified through examination to provide services involving the use or application of •PESTICIDES.

pesticide control act An Act administered by the British Columbia Ministry of Environment, Pesticide Control Branch. The Act and Regulations provide for the certification of •PESTICIDE APPLICATORS and dispensers, the licensing of •PEST CONTROL services and pesticide vendors in the Province of British Columbia, applications for permits to use pesticides on public (Crown) land and on private land that is used for transportation, public utility, and some forestry purposes, and appeals against such permits.

pesticide free zone (=p.f.z.) 1. A strip of land of prescribed width, adjacent to water bodies, residences and other sensitive areas. •PESTICIDES may not be directly applied or allowed to reach the Pesticide Free Zone in more than trace amounts, e.g. via •DRIFT, runoff, or leachate. Cf •BUFFER ZONE. 2. According to the Fish and Wildlife Branch, B.C. Ministry of Environment: An area along or around the perimeter of a lake, stream or other waterbody which is maintained as free of •PESTICIDES (•HERBICIDES, •INSECTICIDES, etc.) to the utmost ability of the applicator. It is recognized that very low (parts per billion or trillion) levels of contamination of almost all areas are commonly found with new detection technologies. However p.f.z.'s are maintained by the professional capabilities of the applicator who is qualified to make the necessary judgements at the time of application (wind speed, terrain, etc.).

phenology The science that deals with the relationship of periodic phenomena to each other. Used to describe the time of occurrence of characteristic events in the •LIFE CYCLE of an organism, especially regarding weather, as when tree buds expand or •INSECTS hatch, particularly as influenced by locality factors, such as aspect, elevation, and exposure.

phenotype The appearance and physiological characteristics of an individual, resulting from the interaction of its •GENOTYPE with its •ENVIRONMENT. Identical phenotypes do not necessarily breed true.

pheromone A •SEMIOCHEMICAL produced by an organism which stimulates a specific behavioral or physiological response by other individuals of the same species, e.g. sex pheromones. Cf •ALLOMONE, •ALLELOCHEMIC, •KAIROMONE, •SYNOMONE.

phloem One of the conducting tissues in •VASCULAR plants, through which products of photosynthsis are transported. Cf •XYLEM.

phycomycete A widely used designation for the so-called 'lower •FUNGI' (Mastigomycotina and Zygomycotina); no longer considered a taxonomically valid grouping. Characterized by •HYPHAE with few or no cross-walls (septa). Includes several fungi which cause •DAMPING-OFF.

physiological race A subgroup of a •PATHOGENIC •SPECIES, characterized by restriction to one or more •RACES, •CULTIVARS or •VARIETIES of a single •HOST species. See •*FORMA SPECIALIS*.

phytocide =•HERBICIDE.

phytophagous Feeding on plants.

phytotoxic Injurious to plants.

pilot project A relatively small-scale, field trial, designed to evaluate a new material, technique or strategy in order to determine its effectiveness and feasibility under operational conditions. Cf •OPERATIONAL TRIAL.

pinholes 1. The cross-sections of tunnels made by •AMBROSIA BEETLE •ADULTS, forming small round holes in timber or timber products; often surrounded by a dark brown or black •STAIN produced by the •FUNGUS which the beetles introduce into the wood and feed upon. 2. Tiny holes in leaves caused by •DISEASE or by •INSECT feeding.

pioneer 1. A •SPECIES capable of invading bare land areas, often in large numbers and over a considerable area, and of persisting until displaced by other species as succession proceeds. 2. Any new arrival in the early stages of succession.

pioneer beetle A •BARK BEETLE that searches for and initiates attack on a suitable •HOST tree. See •HOST SELECTION.

pitch =•RESIN.

pitch-out To repel or drown out an attack of •BARK BEETLES by a strong flow of •RESIN or pitch at the point of attack or at the entrance hole.

pitch pocket (=resin pocket) A well-defined cavity between or within annual growth layers of •CONIFER wood, often lens-shaped, containing liquid or solid •RESINOUS material (pitch). Some pockets may be empty or contain •BARK inclusions.

pitch tube A mass of •RESIN and often •FRASS or •BORING DUST at the point of entry of an •INSECT tunnel into •BARK, cones etc. of various •CONIFERS, as a result of the severing of resin ducts by the boring activity of the •INSECT.

pith fleck A small, localized, isolated patch of wound tissue, darker or lighter than the surrounding wood, appearing on a longitudinal surface as a streak; produced through •INJURY to the •CAMBIUM, in •CONIFERS by the feeding of •ADULT •WEEVILS, in hardwoods by the feeding of •LARVAE of flies in the family Agromyzidae.

pitting A feature of some •DECAYS in which the wood is honeycombed with small pockets, at first filled with whitish fiber, later empty.

plant growth regulator 1. A natural substance that regulates the growth of plants, e.g. by influencing enlargement, elongation, division or activation of cells. See •HORMONE. 2. A natural or synthetic chemical which, when applied as a •PESTICIDE to plant leaves, •STEMS or roots, alters the growth and physiology of the plant.

pocket rot (=peck) Wood •DECAY localized in small areas, usually forming rounded or lens-shaped cavities, surrounded by apparently sound or only slightly modified wood.

point of commencement A fixed landmark, aerial photography •TIE POINT, or known survey point used as a starting point for a •WALK-THROUGH, •PROBE, •CRUISE or other •SURVEY.

polygenic resistance •RESISTANCE, usually quantitative in character, which is controlled by a series of genes. See •HORIZONTAL RESISTANCE. Cf •MONOGENIC RESISTANCE, •OLIGOGENIC RESISTANCE.

polyphagous (=euryphagous) Generalized in feeding habits; having a wide •HOST range. See •HOST SPECIFICITY. Cf •MONOPHAGOUS, •OLIGOPHAGOUS, •STENOPHAGOUS.

population 1. All the individuals of one •SPECIES occurring within a particular area. 2. A Mendelian population, i.e. a group of interbreeding individuals sharing a common gene pool. 3. In statistics, the whole group of items or individuals under investigation, from which a •SAMPLE is drawn.

population dynamics 1. The occurrence of and mechanisms underlying fluctuations in abundance of a •SPECIES or •POPULATION. 2. The science which studies 1.

postemergence treatment •PESTICIDE treatments made after crop plants or •WEEDS •EMERGE through the soil surface. See •APPLICATION (TIMING OF). Cf •PREEMERGENCE TREATMENT, •PREPLANT TREATMENT.

predator A •FREE-LIVING animal that devours other animals (its prey), usually smaller and weaker than itself. To complete its development, a predator usually must consume more than one prey. Predators generally inflict •INJURY, while •PARASITES, if harmful, generally induce •DISEASE.

predisposition •SUSCEPTIBILITY which is •ENVIRONMENTALLY rather than genetically conditioned, i.e. the influence of preexisting living and nonliving •STRESS factors on the susceptibility of an individual •HOST to •DISEASE.

preemergence treatment •PESTICIDE treatment applied after a crop is seeded but before it •EMERGES. May also refer to treatment before •WEEDS emerge. See •APPLICATION (TIMING OF). Cf •POSTEMERGENCE TREATMENT, •PREPLANT TREATMENT.

preplant treatment •PESTICIDE treatment applied before the crop is planted. See •APPLICATION (TIMING OF). Cf •POSTEMERGENCE TREATMENT, •PREEMERGENCE TREATMENT.

prepupa In •INSECTS, a usually inactive •LARVAL •STAGE which occurs after feeding has ceased and before the •PUPA has formed.

prescribed burning The knowledgeable and controlled application of fire to a specific land area to accomplish designated resource •MANAGEMENT objectives, e.g. in •SITE PREPARATION. The burn is set under such conditions of weather, fuel moisture, soil moisture, and fuel arrangement, e.g. windrows, as allow the fire to be confined to a predetermined area, and to produce an intensity of heat and rate of spread required for the objectives. Sometimes used in •PEST MANAGEMENT. See •BROADCAST BURNING, •BROWN AND BURN, •SPRAY AND BURN.

preservative A chemical substance which, when suitably applied to wood, makes it resistant to attack by •FUNGI, •INSECTS or marine borers.

prevention Activities designed to minimize the •IMPACT of a •PEST before an •OUTBREAK occurs, including •SILVICULTURAL activities carried out to increase tree vigor or otherwise reduce •STAND •SUSCEPTIBILITY to pest •DAMAGE. Prevention requires the incorporation of •PEST MANAGEMENT into overall •FOREST MANAGEMENT in order to create ecological conditions unfavorable to pests.

primary attraction Attraction of •BARK BEETLES to a •HOST tree as a result of substances released by the tree itself before any beetles have visited it. Cf •SECONDARY ATTRACTION.

primary host 1. The •HOST on which the first two •STAGES of a •RUST FUNGUS (pycnial and aecial) exist. See •ALTERNATE HOST, •SECONDARY HOST(2). Cf •PRINCIPAL HOST. 2. That •HOST on which the sexual form(s) of an •INSECT or other invertebrate with •ALTERNATING GENERATIONS is found. See •ALTERNATE HOST, •SECONDARY HOST(4). Cf •PRINCIPAL HOST.

primary infection 1. The first •INFECTION of a plant in the spring by an over-wintering •PATHOGEN. Cf •SECONDARY INFECTION. 2. •INFECTION by •DWARF MISTLETOE of previously uninfected •HOST tissue. Cf •SECONDARY INFECTION.

primary inoculum An overwintering •PATHOGEN or its •SPORES that initiate •PRIMARY INFECTIONS. Cf •SECONDARY INOCULUM.

primary insect 1. An •INSECT capable of completing development in an apparently healthy, living tree. Cf •SECONDARY INSECT. 2. A •BARK BEETLE •SPECIES capable of killing healthy trees. Cf •SECONDARY INSECT. 3. The first •INSECT •SPECIES to arrive at or utilize a given •HOST tree.

primary parasite A •PARASITE of an organism that is not itself parasitic. Cf •SECONDARY parasite.

primary pathogen A •PATHOGEN which •INFECTS the •HOST, producing changes in it before •INVASION by other, •SECONDARY pathogens. By definition a primary pathogen thus can induce •DISEASE whether or not secondary pathogens become involved. See •PRIMARY INSECT.

principal host 1. The •HOST on which a particular •PARASITE most frequently occurs. Cf •SECONDARY HOST(1). 2. See •HOST SUSCEPTIBILITY RATING for •DWARF MISTLETOE.

prism plot (= bitterlich plot, point sample, polyareal sample, relascope plot, variable area plot) A •SAMPLING plot in which the probability of inclusion of a given tree is proportional to its basal area. Trees are selected by viewing from the plot center through a fixed-angle prism, which offsets a section of the •BOLE according to the basal area and distance from the viewer. Only those trees in which the offset portion overlaps the remainder of the bole are included in the plot. Used as an alternative to •FIXED AREA PLOTS. If the attribute of interest, e.g. tree volume in timber cruising, is linearly related to tree size, use of prism plots should lead to a gain in sampling efficiency.

probe 1. A ground •SURVEY conducted to confirm an aerial survey or derive preliminary attack information. 2. A ground •SURVEY for •BARK BEETLE •INFESTATIONS. The term is used freely to describe surveys of various types and intensities, but usually implies a compass line (probe-line) through a suspect •STAND with trees within a set distance on either side of the line being assessed for •BARK BEETLE attack.

probe-cruise A combination of the •BARK BEETLE •PROBE and the conventional •CRUISE, in which normal •PRISM PLOTS are established to collect the necessary •CRUISE data and in addition a •STRIP-CRUISE (probe) is done in between the prism plots of the regular cruise.

probing Activity of •APHIDS and other •INSECTS: brief, exploratory penetration of •HOST cells by mouthparts or •OVIPOSITOR, to determine suitability of the prospective host.

proliferation A rapid and repeated production of new cells, tissues or organs.

propagule Any reproductive portion or •STAGE of an organism, whether sexual or asexual in origin, which becomes separated from the parent individual. Usually used with reference to an alga, a •FUNGUS, or a plant.

protectant 1. A •PESTICIDE which prevents an attacking organism from establishing itself on the surface of its •HOST; with •FUNGI, also termed a •FUNGISTATIC chemical. 2. A chemical applied to a plant surface before

it is contacted by a •PATHOGEN, to prevent •INFECTION. Cf •ERADICANT.

protection 1. Use of measures for protecting trees or •STANDS, such as chemical sprays, manipulation of •BIOLOGICAL CONTROL agents, or protection of regenerated stands by removal of •RESIDUAL •INFECTED trees. Cf •EXCLUSION, •ERADICATION, •IMMUNIZATION. 2. The action of a •STRAIN of a •PATHOGEN in protecting a •HOST against •INFECTION by a second strain of the same pathogen. 3. See •FOREST PROTECTION.

punk See •CONK.

punky A soft, weak, often spongy wood condition, caused by •DECAY.

pupa In •INSECTS with •COMPLETE METAMORPHOSIS, the inactive •STAGE during which the transformation from •LARVA to •ADULT takes place.

pupal chamber Chamber excavated in •BARK, wood or other material in which •PUPATION takes place. See •GALLERY.

puparium Thickened barrel-like •LARVAL •CUTICLE encasing the •PUPA in certain flies.

pupation Transformation of an •INSECT •LARVA into a •PUPA and subsequent developmental changes within the pupa.

pustule In plant •PATHOLOGY, a blister-like spot on a leaf, stem or other organ from which erupts a •SPORE-bearing structure of a •FUNGUS.

Q

quarantine Regulation restricting sale, shipment or transport of soil, plants or plant parts, between or within national boundaries, usually to prevent entry of a •PEST into new areas.

R

race 1. A genetically and often geographically distinct mating group within a •SPECIES. 2. A •POPULATION or group of populations within a •SPECIES, which is composed of generally similar individuals and is both discontinuous and distinguishable from other populations of that species, though not sufficiently to be considered a separate species. When the distinguishing characteristics of a race are recognizably adaptive, the term is synonymous with •ECOTYPE and the population may be described as a climatic race, an •EDAPHIC race, etc. A race restricted to a geographic area is a geographic race. Cf •BIOTYPE. 3. A •STRAIN of a •PATHOGEN characterized by the limitation of its •HOST RANGE to particular •SPECIES, •CULTIVARS or •VARIETIES. See •*FORMA SPECIALIS*.

race non-specific resistance •RESISTANCE to all •RACES of a particular •PATHOGEN. See •FIELD RESISTANCE, •HORIZONTAL RESISTANCE. Cf •GENERAL RESISTANCE.

randomization 1. In an experiment, the process of assigning placement of •CONTROL or experimental treatments (e.g. unbaited *vs* •SEMIOCHEMICAL-•BAITED traps) in such a way that the probability of assignment to a particular place is equal for all treatments. 2. In an experiment, the process of assigning membership in control or experimental groups (e.g. untreated *vs* •PESTICIDE-treated trees) in such a way that the probability of assignment to a particular group is equal for all individuals.

range 1. Geographical and altitudinal area of occurrence of a particular •SPECIES or other •TAXON. 2. See •HOST RANGE.

rare host See •HOST SUSCEPTIBILITY RATING for •DWARF MISTLETOE.

red attack One of the 'attack codes' specified in the B.C. Ministry of Forests Cruising Manual for describing trees •INFESTED by •BARK BEETLES. The •CROWNS first fade to straw color, then to red, and finally to rust color before the needles fall off the tree. By the time the foliage is rust colored, the beetles have usually left these trees to infest green trees. See •RED-TOP, •SORREL-TOP. Cf •GREEN ATTACK •GREY ATTACK.

red-belt •WINTER •INJURY to •CONIFERS, usually confined to altitudinal zones or bands which approximately follow distinct contour lines.

red stain (= red heart) A pronounced reddish discoloration, often extensive, induced by •FUNGI in the •HEARTWOOD of •CONIFERS and a few hardwoods. The term particularly refers to a firm, •INCIPIENT decay associated with *Armillaria*, *Fomes*, *Phellinus* and *Polyporus* •SPECIES in •CONIFERS. See •STAIN.

red-top Advanced color phase of the foliage of a •CONIFEROUS tree killed by •INSECTS (e.g. •BARK BEETLES) or •PATHOGENS, usually characteristic of a tree killed during the previous season. Although a •RED ATTACK tree is a red-top, not all red-tops are red attack trees (e.g. white pine •BLISTER rust causes red-tops). The terms are often used interchangeably. Cf •BLACK-TOP, •SORREL-TOP.

reemergence The phase of •BARK BEETLE activity during which •ADULTS bore back out of the •BARK after •OVIPOSITING, or after abandoning a gallery.

registered pesticide A •PESTICIDE which has been accepted under the provisions of the federal •PEST CONTROL PRODUCTS ACT for the specific uses and purposes claimed. Submissions for registration are reviewed by Agriculture Canada, which administers the Act, and by special consultants in Fisheries and Oceans Canada, Environment Canada, and Health and Welfare Canada for acceptance or rejection. Two levels of registration are possible:

full registration: all required information for a given use has been submitted, and the use appears on the label. In some cases •MINOR USE REGISTRATION may be granted for additional uses.

temporary registration: a small amount of data is still required for a particular use, the use may not appear on the label, and the use is permitted on an operational scale for a certain period, usually a maximum of one year.

The P.C.P. registration number must be displayed on the label of each pesticide container sold or used in Canada. See •PEST CONTROL PRODUCT.

registered use One of the specific uses (i.e. application to particular crops and •TARGET •PESTS) for which a particular •PESTICIDE or other •PEST control product has been registered. See •REGISTERED PESTICIDE.

regression Reversion to an earlier stage of succession, due to destruction of the vegetation of a •SITE, as by fire, grazing, cutting, etc., usually with subsequent deterioration of the soil, as by exposure, erosion or loss of nutrients.

repellant 1. A substance so obnoxious to animal life, more particularly to •INSECTS, birds and mammals, as to deter attack on the object (e.g. •SEED, seedlings) to which it has been applied. 2. A substance that causes an organism to make oriented movements away from its source.

research 1. Any studious inquiry. 2. In science, investigation carried out for the purpose of discovering new facts. The investigator sets a hypothesis and then tests it in repli-

cated experiments involving •CONTROL and experimental treatments.

resident population A •POPULATION of •INSECTS in a particular locality which persists there for at least one •GENERATION, often from year to year. Cf •IMMIGRANT POPULATION.

residual (tree) 1. Unwanted tree left after a •STAND has been logged. 2. See •INFECTED RESIDUAL. 3. In B.C. Ministry of Forests standard •CRUISING procedures, all living trees measured on each •SAMPLE plot are classified as either •RESIDUAL or suspect. Residual trees are living trees which bear none of the external indications of •DECAY listed under the definition of •SUSPECT tree.

resin (= pitch) The secretions of certain trees, insoluble in water but soluble in organic solvents, often exuding from wounds or produced in response to •INSECT attack. See •OLEORESIN, •RESINOSIS.

residue A •PESTICIDE, its metabolic derivatives, or degradation products remaining (usually in trace amounts) on or in a crop after treatment, or in soil or water.

resinosis 1. A flow of •RESIN or pitch in a •CONIFER, in response to •INFECTION, wounding or •INSECT attack. 2. Impregnation of tissue with •RESIN or pitch.

resistance 1. The ability of •INSECTS, •FUNGI, •WEEDS or other •PESTS to survive normally lethal doses of an •INSECTICIDE, •FUNGICIDE, •HERBICIDE, or other •PESTICIDE. 2. The ability of an organism to overcome, completely or in some degree, the activities and adverse effects of a •PATHOGEN, •PARASITE or adverse •ABIOTIC factor. The antonym of •SUSCEPTIBILITY. See •HORIZONTAL resistance, •VERTICAL resistance. Cf •IMMUNITY, •SUSCEPTIBILITY, •TOLERANCE.

resolution The minimum distance between two adjacent features, or the minimum size of a feature, which can be detected by a given photographic system. A measure of the ability of the system, including lens, exposure, processing and other factors, to render a sharply defined image. It is expressed in terms of lines per mm recorded by a particular film under specified conditions.

restricted use permit A permit granting permission for an unregistered use of a •PESTICIDE for a limited period of time, in a particular, usually fairly small, area under specified conditions. Such permits are issued by the Administrator of the •PESTICIDE CONTROL ACT for research activities. See •REGISTERED PESTICIDE. Cf •MINOR USE REGISTRATION.

resurgence A rapid recovery of numbers of a •PEST •POPULATION which had been significantly reduced by •PESTICIDE treatment, due to decreased •INTRASPECIFIC competition at low densities and/or pesticide-caused mortality of •NATURAL ENEMIES.

retrogression The retreat or deterioration of a plant •COMMUNITY from a later stage of succession to an earlier one, usually brought about by •BIOTIC changes or other influences of human activity. Cf •REGRESSION.

rhizome An underground •STEM, usually in a horizontal position. Distinguished from a root by the presence of nodes, sometimes bearing buds or scalelike leaves, and •INTERNODES. Often thickened and containing accumulated food.

rhizomorph A rootlike strand or cord of •HYPHAE, often much branched, occurring in certain •FUNGI, e.g. *Armillaria*.

rhizosphere The micro-environment of roots, i.e. the area of soil surrounding plant roots which is chemically, physically or biotically influenced by their presence. Important in consideration of the •ETIOLOGY of soil-borne •PATHOGENS.

ring rot Any •ROT localized mainly in the early wood (springwood) of the annual growth rings, giving a concentric pattern of decayed wood in cross section; e.g. characteristic of rot produced by *Fomes pini*.

riparian vegetation Vegetation growing along banks of streams. Generally a critical component of fish and wildlife •HABITAT. Important for stabilization of stream banks, as cover for wildlife, and as a major source of fish food organisms, stream nutrients and large organic debris. See •BRUSH, •WEED TREE.

riparian zone Zone immediately adjacent to streams or water bodies, with particular reference to the vegetation.

risk 1. In toxicology, a measure of the probability and severity of an adverse effect or effects. Cf •HAZARD. 2. The probability and predicted severity of an •OUTBREAK of a given •PEST. Cf •HAZARD, •HAZARD RATING.

roadside survey A ground •SURVEY conducted from a vehicle either with observer and driver or driver alone stopping to observe.

rodenticide A •PESTICIDE used to •CONTROL or •MANAGE rodents.

rogue 1. To remove and destroy unwanted crop plants from a field or plantation, based on the presence of undesirable characteristics, •INSECT •INFESTATION, or •PATHOGEN •INFECTION. 2. A plant so removed. See •CULL.

root clipping The cutting or clipping of roots by gophers or other small mammals.

root collar (= root crown) The part of a tree where the main roots join the trunk, usually at or near ground level.

root graft A naturally occurring vegetative union between roots of different individual trees, through which •PATHOGENS or •TRANSLOCATED •HERBICIDES may pass from tree to tree. Often sizeable groups of trees may become interconnected. Root grafting may also occur between stumps and living trees, maintaining life in old stumps. Root grafts are most frequent among trees of the same •SPECIES, but apparently may also occur between trees of different species. See •FLASHBACK.

root kill The death of trees, •SHRUBS, etc., due to freezing of their roots. Frequent in regions where precipitation is light and the soil freezes deeply.

root rot 1. A •ROT that occurs chiefly in the roots of trees or in the roots of seedlings that have developed woody •STEM tissues. 2. A •DISEASE which is characterized by this •SYMPTOM.

root sucker A •SHOOT arising from a root.

rot 1. A state of •DECAY, usually fairly advanced and obvious, of woody or succulent plant tissue, caused by invading •FUNGI or •BACTERIA. Many common names of rots such as •BROWN, •BUTT, •DRY, •HEART, •POCKET, •RING, •ROOT, •WET, and •WHITE rots, are based on color, texture or location. See •DECAY. 2. A •DISEASE which is characterized by this •SYMPTOM.

rotary-wing Refers to helicopters. Cf •FIXED-WING.

rotation The period of years required to establish and grow a timber crop to a condition of maturity specified by the •MANAGEMENT objectives, including the use specified for the crop. See •PATHOLOGICAL ROTATION AGE, •ROTATION AGE.

rotation age The age of a crop of trees at •HARVEST, when this coincides with the time of •ROTATION.

ruderal 1. An •INTRODUCED plant •SPECIES growing under disturbed conditions. 2. Native or •INTRODUCED plant of old fields, roadsides and waste places.

run-off The shedding of spray from plant surfaces during or immediately after application. Droplets may coalesce to form a continuous film and surplus liquid runs off the surface. Directions for •PESTICIDE application may specify 'spray to run-off' to ensure complete coverage of the plant surface.

rust 1. A •DISEASE induced by •PARASITIZATION by one of the •RUST FUNGI. 2. Masses of orange colored spores on leaves, fruits or •STEMS. 3. A •RUST FUNGUS.

rust fungus One of a group of •BASIDIOYMCETE fungi in the order Uredinales, commonly causing •BLISTER-like growths on needles, branches or •STEMS of •HOST plants. These fungi are characterized by •OBLIGATE PARASITISM, restricted •HOST RANGE, and complex •LIFE CYCLES, with as many as five •SPORE types (aecial, pycnial, uredinial, telial, basidial), often involving two or more hosts, and the production of masses of orange spores during one stage.

S

salvage cutting A cutting made to remove trees that are dead, dying or deteriorating (e.g. because overmature or materially damaged by fire, wind, •INSECTS, •FUNGI, etc.) to utilize remaining •MERCHANTABLE wood before it becomes worthless. Cf •SANITATION CUTTING.

salvage felling Extraction of •RESIDUAL TREES that for one reason or another were not removed at the principal felling.

sample See •SAMPLING.

sampling The selection of a portion (called a sample) of a •POPULATION for measurement in order to make estimates or inferences about the entire population.

sanitation 1. Removal and/or destruction of •INFECTED plant parts or individuals. 2. Disinfection and/or disinfestation of tools and machinery.

sanitation cutting The removal of •INFECTED or •INFESTED dead or damaged trees, or of •SUSCEPTIBLE trees, essentially to prevent the spread of •PESTS or •PATHOGENS. May be combined with •SALVAGE CUTTING as •SANITATION/SALVAGE CUTTING. Cf •SANITATION spacing.

sanitation/salvage cutting Cutting made to remove already •INFECTED or •INFESTED trees and trees of high •PEST •HAZARD from a •STAND, in order to reduce subsequent overall losses to pests. Cf •SALVAGE CUTTING, •SALVAGE LOGGING, •SANITATION CUTTING, •SANITATION SPACING.

sanitation spacing (=sanitation thinning) Cutting of young •STANDS to control density, •SPECIES composition or •DISEASE level by combining spacing with removal of the •RESIDUAL or young trees which are defective in form or heavily •INFECTED with •DWARF MISTLETOE or other •DISEASE. Cf •SANITATION cutting.

sap 1. In plants, the fluid contents of the •VASCULAR system, carrying dissolved mineral and organic nutrients. 2. (=cell sap) In plant cells, the contents of the vacuole. 3. The moisture and dissolved substances in unseasoned wood.

saprogen An organism capable of producing •DECAY in non-living organic material, e.g. dead wood.

saprophyte An organism that commonly feeds on dead organic material, usually by decomposing and absorbing it, assisting in its •DECAY, but which may in exceptional circumstances attack living •HOSTS, e.g. those weakened by •PRIMARY PARASITES or •PATHOGENS.

sapstain A •STAIN that predominantly affects the •SAPWOOD, particularly that resulting from the growth of •FUNGI which do not cause •DECAY. See •BLUESTAIN, •BROWN STAIN.

sapwood The outer layers of wood which, in the growing tree, form the active water conducting system, containing living cells and food reserve materials, such as starch. Generally lighter in color than •HEARTWOOD, but may not be clearly differentiated. See •XYLEM. Cf •HEARTWOOD.

sawfly An •INSECT in the suborder Symphyta of the Hymenoptera, characterized by females with a sawlike •OVIPOSITOR for laying eggs in plant tissue, and •LARVAE that are •CATERPILLARS.

scab A dark, crustlike •LESION on a leaf or fruit.

scale insect One of a group of small, plant sucking, usually immobile •INSECTS in the order Homoptera, often having a hard, convex covering over its body, with no visible appendages or segmentation.

scar 1. A mark left after regrowth of damaged tissue following an •INJURY, e.g. an •OVIPOSITION scar. 2. A mark made by the natural separation (abscission) of one plant organ from another, e.g. as on a twig after leaf fall.

scarification 1. Mechanical removal of vegetation in blocks or strips. 2. Cultivation of the forest floor: crushing •SLASH and •BRUSH, mixing mineral soil with the humus layer or scraping the humus layer aside or into piles in order to expose mineral soil. A type of •SITE PREPARATION designed to enhance reforestation or natural regeneration. 3. In •STAND CONVERSION, uprooting, windrowing or piling, and perhaps burning, of •UNMERCHANTABLE hardwood and •BRUSH.

scorch Injury to •BARK, foliage, flowers or fruit from excessive heat, whether from fire or sunlight, from hot, freezing, salt-laden, fume-laden or unduly strong winds, from unbalanced nutrition, or from poisoning, e.g. due to the misapplication of a •PESTICIDE.

screefing Removal of herbaceous vegetation and duff (leaf litter, plant debris and raw humus) to expose a •WEED-free soil surface for planting. A type of •SITE PREPARATION which may be carried out by mechanical or chemical means.

screening 1. The separation of individuals in a •POPULATION with respect to their responses to a particular •PEST, •PESTICIDE or adverse •ENVIRONMENTAL factor, e.g. in the initial stages of a breeding program, in which •RESISTANT individuals are identified. 2. The separation of agents according to their •EFFICACY, e.g. the screening of chemicals for their ability to kill a particular organism.

second growth A forest or •STAND that has grown up naturally after removal of a primeval stand by fire, cutting, •INSECT attack or other cause.

secondary attraction Attraction of •BARK BEETLES to a •HOST tree after initial attack by •PIONEER BEETLES, in response to release of •PHEROMONES by the resident beetles, increased release of primary attractants (•KAIROMONES) due to boring activity of resident beetles, or both. Cf •PRIMARY ATTRACTION.

secondary fungus A weak •PARASITE or •SAPROPHYTE which usually invades only •PREDISPOSED, weakened or killed •HOST individuals.

secondary host 1. A •HOST •SPECIES attacked less frequently than a main

or •PRINCIPAL host. It is not correct to use the term 'secondary host' to mean economically unimportant host. 2. The host on which the 3rd, 4th, and 5th stages (uredinial, telial, basidial) of a •RUST FUNGUS develops. Cf •PRIMARY HOST (1). 3. See •HOST SUSCEPTIBILITY RATING for •DWARF MISTLETOE. 4. For •APHIDS with complex •LIFE CYCLES, the •HOST on which only asexual reproduction occurs. Cf •PRIMARY HOST (2).

secondary infection 1. An •INFECTION resulting from the spread of •INOCULUM produced during a •PRIMARY or earlier secondary infection, without an intervening inactive season; an infection produced by a •SECONDARY INOCULUM. 2. •INFECTION by •DWARF MISTLETOE of previously infected tissue. Cf •PRIMARY INFECTION.

secondary inoculum •INOCULUM produced by •INFECTIONS that took place earlier in the same growing season. Cf •PRIMARY INOCULUM.

secondary insect 1. •INSECT found generally in unhealthy or dead trees. Cf •PRIMARY INSECT. 2. Any •INSECT that can successfully attack only plants that are already weakened, dying or dead, e.g. many •BARK BEETLES. Cf •PRIMARY INSECT.

secondary invader A •SAPROPHYTIC •MICROORGANISM which colonizes dead cells, in association with or after action of a •PATHOGEN. Cf •SECONDARY PATHOGEN.

secondary parasite = •HYPERPARASITE.

secondary pathogen A •PATHOGEN which invades the •HOST after establishment of a •PRIMARY PATHOGEN. Secondary pathogens may or may not be able to induce •DISEASE on their own.

secondary pest A •SPECIES which becomes a •PEST after natural or human interference with processes that normally regulate its density to non-pest levels. Most commonly occurs after •PREDISPOSITION of a •HOST by another pest species, or following the unintended destruction of the •NATURAL ENEMIES of the secondary pest species, e.g. as a result of •PESTICIDE applications intended to control another pest.

sedentary Staying in one place, stationary.

seed 1. Multicellular reproductive structure of higher plants, usually the product of sexual processes, consisting of an embryo and stored food material surrounded by a seed coat (testa). Cf •SPORE. 2. The definition in the Regulations under the •PEST CONTROL PRODUCTS ACT is extended to include 'any generative part of a plant used for propagation,' including bulbs, tubers and corms, none of which are seeds in the botanical sense.

seed predation Consumption of •CONIFER •SEED, primarily by rodents.

seed source 1. The locality where a particular •SEED lot was collected. 2. The previously •INFECTED tree from which a •DWARF MISTLETOE •INFECTION has spread. 3. The origin of •SEED of a •BRUSH or •WEED •SPECIES.

seed year A year in which a given tree •SPECIES produces, over a considerable area, a •SEED crop greatly in excess of normal. Applied usually to trees of irregular or infrequent seed production.

selection intensity See •SELECTION PRESSURE.

selection pressure 1. The action of an agent which tends to produce changes in relative frequency of different •GENOTYPES in a •POPULATION by causing differential mortality or •FERTILITY of individuals carrying the different genotypes. 2. (= selection intensity) The degree to which 1. occurs, i.e. a quantitative estimate of the differences in mortality or •FERTILITY produced.

selective herbicide A •HERBICIDE that is more •TOXIC to some plant •SPECIES than to others. This implies utilizing morphological, biochemical or physiological differences between desired and undesired species. The selectivity of a herbicide treatment may be based in part on timing and/or mode of application when an appropriately selective herbicide is not available. See •APPLICATION (TIMING OF), •DORMANT APPLICATION, •POSTEMERGENCE TREATMENT, •PREEMERGENCE TREATMENT, •PREPLANT TREATMENT. Cf •NONSELECTIVE HERBICIDE.

selective pesticide A •PESTICIDE that is more •TOXIC to some •PESTS than to •NON-TARGET ORGANISMS. Cf •BIOCIDE.

semiochemical A chemical substance that mediates one or more interactions between organisms, i.e. a message-bearing chemical. See •ALLELOCHEMIC, •ALLOMONE, •KAIROMONE, •PHEROMONE, •SYNOMONE.

semiparasite A green plant having its own root system, but partly dependent for its nutrition on functional connection with the roots of other plants.

senescent Aging or old.

sensitivity Liability to •DAMAGE from attack by a •PEST or from exposure to a •TOXIC material (e.g. a •PESTICIDE) or adverse •ENVIRONMENTAL condition. The antonym of •TOLERANCE. Cf •IMMUNITY, •RESISTANCE, •SUSCEPTIBILITY.

sequential sampling A •SAMPLING method designed as an aid to prediction or decision-making, which is based on predetermined abundance classes for the •PEST, •SIGN or •SYMPTOM of concern. Basic units, e.g. branches or twigs, are examined until the number found of the pest, sign or symptom fits one of the defined classes, e.g. treatment vs no-treatment classes. Considerable research is required to design such a sequential sampling scheme, which can lead to considerable reduction in the number of samples required to make a decision.

seta (plural = setae) In •INSECTS, a hollow, hair-like, usually rigid extension of the •CUTICLE.

shade tolerance Capacity of a tree to develop and grow in the shade of and in •COMPETITION with other trees.

shepherd's crook •LEADER or branch with a down-curved tip in the shape of a shepherd's crook, characteristic of attack by certain •INSECTS or •PATHOGENS, e.g. terminal •WEEVILS on spruce and *Fusarium* •ROOT ROT in Douglas-fir seedlings. Cf •CROOK.

shoot 1. The above ground, generally ascending, axis of a plant, including, in the seedling and transplant stages, any branches and leaves. Cf •LEADER. 2. Any young, slender, above ground outgrowth from a plant, particularly a sprouting •STEM or branchlet, often taken to include its leaves.

shot hole 1. A type of •LEAF spot in which the •NECROTIC tissue falls out, leaving a hole in the leaf. 2. Larger form of •PINHOLE produced in wood by •AMBROSIA BEETLES, or •BARK by •EMERGING •BARK BEETLES.

shrub A woody, perennial plant differing from a perennial •HERB in its persistence and woody stem(s), and less definitely from a tree in its lower stature and the general absence of a well-defined main stem.

sign Visible portion of a •PATHOGEN or other •PEST, e.g. a •CONK, or its products, e.g. •FRASS, seen on or in the •HOST plant. Cf •SYMPTOM.

significant pest incidence An occurrence of an •INDIGENOUS or •INTRODUCED •PEST in numbers or circumstances that are judged detrimental to fulfillment of resource •MANAGEMENT objectives.

silvicide See •ARBORICIDE, •HERBICIDE.

silvicultural control •SUPPRESSION or •MANAGEMENT of a •PEST •POPULATION, or reduction of pest •DAMAGE by •SITE preparation, growing genetically improved trees, management of •SPECIES composition, age or •STOCKING, or other manipulations carried out in •SILVICULTURE. (In •FORESTRY = CULTURAL control.)

silviculture 1. Generally, the science and art of cultivating (i.e. growing and tending) forest crops, based on a knowledge of silvics (the life histories, general characteristics and requirements for growth of forest trees). 2. More particularly, the theory and practice of controlling the establishment, •SPECIES composition, distribution of age and size classes, and growth of forests or •STANDS.

single-tree disposal The practice of attempting to •ERADICATE small •BARK BEETLE •INFESTATIONS by disposing of individual trees, e.g. by removing and milling, or by cutting and burning them, prior to •EMERGENCE of the bark beetle •BROOD.

site An area in terms of its •ENVIRONMENT, particularly as this determines the type and quality of the vegetation the area can carry. Sites are classified either qualitatively, by their climate, soil and vegetation, into site types, or quantitatively, by their potential wood production, into •SITE CLASSES.

site class A measure of the relative productive capacity of a •SITE for the crop or •STAND under study, based e.g. on volume or height of •DOMINANT and •CO-DOMINANT trees or the maximum •MEAN ANNUAL INCREMENT that is attained or attainable at a given age. Cf •SITE INDEX.

site index Height that a particular •STAND may be expected to reach at a reference age, usually 50 or 100 years. A quantitative indication of •SITE quality. Usually based on the height of the •DOMINANT and/or •CO-DOMINANT trees in a mature stand. See •SITE CLASS.

site preparation Any planned measure taken after harvesting to prepare a site for the favorable reception and satisfactory growth of either naturally or artificially disseminated •SEED or planted seedlings. See •BROADCAST BURNING, •PRESCRIBED BURNING, •SCARIFICATION.

site rehabilitation 1. The conversion of potentially productive land presently occupied by •STANDS of undesirable tree •SPECIES or by •BRUSH to a condition appropriate for establishing desired crop tree species. See •NSR, •STAND CONVERSION. Cf •CONIFER RELEASE, •SITE PREPARATION. 2. Stump removal after harvesting to reduce or eliminate •ROOT ROT •INFECTION CENTERS.

six-class system An example of an •INFECTION RATING SYSTEM for rating •INTENSITY of •DWARF MISTLETOE •INFECTION on individual trees. Degrees of infection (the 'infection ratings') are determined by classifying each third of the •CROWN as either 0 (healthy = no visible infection), 1 (light = up to and including 1/2 the branches infected), or 2 (severe = more than 1/2 the branches infected) and adding the three figures. A tree is thus placed into one of six •INFECTION CLASSES.

skeletonizer An •INSECT which consumes the soft tissues of a leaf, leaving the veins intact. Cf •NEEDLE MINER.

sketch-map 1. To sketch from an aircraft areas of •INSECT and/or •DISEASE •DAMAGE on hand-held maps or a series of aerial photographs. 2. The map thus produced.

slash The residue left on the ground after logging, thinning, mechanical •BRUSH CONTROL or other operations, and/or accumulating there as a result of storm, fire, •GIRDLING, felling or poisoning of unwanted vegetation. It includes unutilized logs, uprooted stumps, broken or uprooted •STEMS and the heavier branchwood (heavy slash), lighter tops and branchwoods, twigs, leaves, bark and chips (light slash).

slash and burn A method of •STAND CONVERSION. Felling of all •UNMERCHANTABLE trees, treatment of understory vegetation with a •HERBICIDE or •DESICCANT, and then burning. See •PRESCRIBED BURNING. Cf •BROWN AND BURN.

slash disposal The treatment or handling of •SLASH, particularly so as to reduce fire, •INSECT or •DISEASE •HAZARD.

soap See •INSECTICIDAL SOAP.

soil inhabitant 1. Any organism that lives in the soil during all or part of its life. 2. A •MICROORGANISM that is usually strongly •COMPETITIVE with other microorganisms normally occurring in the soil, and which often survives many years in the complete absence of suitable •HOSTS. Cf •SOIL INVADER.

soil invader A •MICROORGANISM that is poorly •COMPETITIVE with microorganisms normally occurring in the soil, and which seldom survives more than one or two years in the soil in the complete absence of suitable •HOSTS. Cf •SOIL INHABITANT.

soil treatment Application of water-soluble •HERBICIDE to the ground for absorption through the roots of •BRUSH •SPECIES.

solitary Occuring singly or in pairs, not social.

sorrel-top The initial color phase (usually •CHLOROTIC yellow in spruce or orangeish in firs and pines) of the foliage of a •CONIFEROUS tree killed by •INSECTS (e.g. •BARK BEETLES) or •PATHOGENS, usually characteristic of a tree killed during the current season. Cf •BLACK-TOP.

species (plural = species) A group of actually (or potentially) interbreeding natural •POPULATIONS which are reproductively isolated from other such groups. The members of a species form (1) a reproductive community, in which individuals recognize each other as potential mates, (2) an ecological unit, which interacts as a unit with other species with which it shares the •ENVIRONMENT, and (3) a genetic unit consisting of a large, interconnecting gene pool. See •TAXON.

spike-top 1. The pointed dead tip of a living tree from which practically all needles and banches have fallen; may be caused by •INSECT attack or severe •DWARF MISTLETOE •INFECTION. 2. A tree with such a dead tip.

spore A reproductive structure in •FUNGI and lower plants (e.g. ferns, mosses, club mosses, liverworts), consisting of one or several cells and not containing a pre-formed embryo. Cf •SEED.

sporophore A •SPORE-producing or spore-supporting structure; in the larger •FUNGI also termed a •FRUITING BODY or fructification. See •CONK.

spot A discrete •LESION, commonly •CHLOROTIC or •NECROTIC, differing in color or tint from the surrounding tissues.

spot infestation •PEST •DAMAGE of a local nature confined to small areas of timber. See •INFESTATION(2).

spot treatment 1. A •PESTICIDE or fertilizer applied over small continuous restricted area(s) of a whole unit rather than generally over the unit, e.g. treatments of spots or patches of •WEEDS within a larger field. 2. Application of a granular •FORMULATION of •HERBICIDE to eliminate individuals or clumps of •BRUSH, or directed sprays around planted tree seedlings for herbage •CONTROL.

spray and burn A method of •SITE REHABILITATION. Treatment of •HARDWOODS and •BRUSH with •HERBICIDES, followed by •BROADCAST BURNING. See •BROWN AND BURN. Cf •SLASH AND BURN.

stadium The period between •INSECT •MOULTS. Cf •INSTAR.

stag-headed A tree dead at the top as a result of •INJURY, •DISEASE or deficient moisture or nutrients, with dead branches projecting from the upper •CROWN. Cf •SPIKE-TOP.

stage A distinct, sharply different period in the development of a •FUNGUS or an •INSECT, such as egg stage, •LARVAL stage, marked by distinctiveness of form. Cf •INSTAR.

stain Any alteration in the natural color of wood, other than fading, e.g. due to activity of •BACTERIA, •FUNGI, or chemicals. See •BLUE-STAIN, •BROWN STAIN, •RED STAIN.

stain fungi •FUNGI that cause wood discoloration but little or no •DECAY.

stand A community, particularly of trees, possessing sufficient uniformity with regard to •SPECIES composition, age and size class distribution, spatial arrangement, or condition, to be distinguishable from adjacent communities, and so forming a •SILVICULTURAL or •MANAGEMENT unit. The concept includes both natural and planted crops and carries no connotations of a particular age — thus a flush of natural •REGENERATION may be referred to as a stand.

stand conversion (= site conversion) 1. (= species conversion) Changing the •SPECIES composition of a •STAND to species that are more desirable from a •FOREST MANAGEMENT standpoint. This may, but does not always, imply changing a •DECIDUOUS stand to a •CONIFER stand. The term may also refer to changing the main stand component from one conifer to another, e.g. by harvesting trees subject to a particular •PEST problem and replacing them with trees of a non-•SUSCEPTIBLE •SPECIES. 2. See •SITE REHABILITATION.

stand density A quantitative measure of tree cover in an area, expressed on a per hectare basis, in terms of •CROWN CLOSURE, number of trees, •BASAL AREA or volume. In this context, tree cover includes seedlings and saplings; hence the concept carries no connotation of a particular age. Cf •STOCKING.

stand infection index An evaluation of the intensity of •PATHOGEN •INFECTION in a •STAND based on the average of •INFECTION CLASSES for individual trees. Applied most frequently to •DWARF MISTLETOE infected stands. See •SIX CLASS SYSTEM.

stand tending Activities, such as thinning, spacing, removal of •MISTLETOE-•INFECTED trees, and •WEED or •BRUSH CONTROL, carried out in already established •STANDS.

stem The principal axis of a plant, from which buds and •SHOOTS develop. With woody •SPECIES, the term •STEM applies to all ages and thicknesses, unlike the terms trunk and •BOLE, which refer to tree stems of substantial thickness.

stem canker A •CANKER, associated with •INFECTION by a •RUST or other •FUNGUS, located on the •STEM of the infected tree. Such a canker may grow all the way around the stem, •GIRDLING and thus killing the tree.

stenophagous Quite restricted in feeding habits (more so than •OLIGOPHAGOUS); of limited •HOST range. See •HOST SPECIFICITY. Cf •MONOPHAGOUS, •POLYPHAGOUS.

stereo pair Two photographs of the same area taken from different camera stations so as to afford stereoscopic vision, i.e. enabling the observer to obtain an impression of depth by means of two different perspectives of objects.

stimulant A chemical substance that elicits such actions as •GERMINATION, growth, feeding, mating or •OVIPOSITION by an organism.

stocking 1. In •SILVICULTURE, a qualitative indication of the number of trees in a •STAND relative to the number considered most desirable. Commonly used terms are 'overstocked,' 'well-stocked,' 'fully stocked,' 'partially stocked.' See •NSR. Cf •STAND DENSITY. 2. In •SILVICULTURE, the number of trees per unit of land area.

strain 1. An •ISOLATE. 2. A group of similar •ISOLATES. 3. Any breeding selection of a sexually reproducing •CULTIVAR.

stress 1. Any environmental factor that restricts growth and/or reproduction of an organism or a •POPULATION, e.g. significant shortage of soil moisture may place a plant under water stress. 2. Any stimulus or other factor acting to disturb the steady state (equilibrium) of an organism or other system. 3. In mechanics, a force, distributed over an area arising from the action of one body on another or of one part of a body on another part. In wood, refers especially to forces developed in resistance to loading. Resistance to such stress may be lessened by •PEST •DAMAGE, e.g breakdown of wood by •FUNGAL action. See •DECAY.

strip cruise A •CRUISE in which the plots measured are in the shape of long narrow strips.

stripping Peeling the •BARK completely off a tree or log, e.g. to remove •BARK BEETLE •BROODS and expose them to adverse •ENVIRONMENTAL conditions. Cf •GIRDLING.

stubbling A method of killing •BRUSH and small diameter trees. Vegetation is slashed or felled and the remaining stubble is sprayed with a •HERBICIDE. Cf •HACK AND SQUIRT.

stump rot •DECAY in or of a cut stump.

stumpage 1. The dollar value of standing uncut timber. 2. The price determined under B.C. Ministry of Forests appraisal procedures and paid as a tax to the Crown for timber harvested from public (Crown) land, except the old temporary tenures. Under Section 88 of British Columbia's Forest Act expenses for forestry work, including •PEST MANAGEMENT, are repaid to a company by the Ministry of Forests as a discount on stumpage payable.

stunting Dwarfing of whole plants.

stunted Reduced condition of a plant in size and vigor due to unfavorable •ENVIRONMENTAL conditions or •DISEASE.

substrate The material or substance on which a •MICROORGANISM feeds and develops. Cf •SUBSTRATUM.

substratum 1. Material underlying something, e.g. the soil below plants or animals. 2. A lower layer of soil or rock.

sucker A •SHOOT growing from the lower portion of a •STEM, or especially from below ground level, either from a •RHIZOME or from a root.

sunscald 1. Localized injury to •BARK and •CAMBIUM, often resulting in

wounds, caused by a sudden increase in exposure of a •STEM to intense sunshine and high temperatures. See •WINTER SUNSCALD. Cf •LEAF SCORCH, •WHITE-SPOT. 2. A blanching of surface tissues of leaves from sudden exposure to hot sun.

superparasitism 1. The simultaneous •INFESTATION of an individual •HOST by two or more individuals of the same •PARASITE •SPECIES. See •PARASITE, •PARASITOID. Cf •HYPERPARASITISM, •MULTIPLE PARASITISM. 2. In •ENTOMOLOGY, the •INFESTATION of an individual •HOST by a greater number of individuals of one •PARASITE •SPECIES than can be supported for complete development by that host. See •PARASITE, •PARASITOID. Cf •HYPERPARASITISM, •MULTIPLE PARASITISM.

suppressed (trees) In an even-aged group of trees or •STAND, trees with •CROWNS entirely below the general level of the crown cover formed by the •DOMINANT and •CO-DOMINANT trees. Growth of such trees is generally restricted by the lack of available light. See •CROWN CLASS. Cf •INTERMEDIATE (TREES).

suppression The reduction of a •PEST •POPULATION to acceptable levels through application of •SILVICULTURAL, •MECHANICAL, •MANUAL, •BIOLOGICAL and/or •CHEMICAL CONTROL MEASURES. See •DIRECT SUPPRESSION, •INDIRECT SUPPRESSION, •PEST CONTROL.

surveillance •PEST •DETECTION conducted by field personnel in conjunction with other routine activities, such as inventory, trail maintainance, fire reconnaissance, or •STAND TENDING. Surveillance consists of recognizing and reporting unusual pest activity and abnormal tree or •STAND conditions. Cf •MONITORING, which is sometimes used as a synonym.

survey Systematic observation of a given, usually large, forest area in order to detect •PEST •OUTBREAKS, estimate pest abundance and/or evaluate •DAMAGE. Cf •CRUISE, •PROBE, •ROADSIDE SURVEY, •SKETCH-MAP, •WALK-THROUGH.

survivorship The rate of survival or proportion of individuals of a •SPECIES or •POPULATION surviving over a specific period, e.g. a developmental •STAGE or a •GENERATION.

susceptibility Degree to which an organism is subject to •INFECTION or •INFESTATION by another organism. The antonym of •RESISTANCE. See •DISEASE, •ESCAPE. Cf •SENSITIVITY.

suspect tree In B.C. Ministry of Forests standard •CRUISING procedures, all living trees measured on each •SAMPLE plot are classified as either •RESIDUAL or suspect. Suspect trees are living trees which bear one or more of the following external indications of •DECAY, on or immediately adjacent to the trunk of the tree: •CONKS, •BLIND CONKS (swollen knots), scars, •FORK or pronounced •CROOK, •FROST CRACK, trunk •INFECTIONS of •MISTLETOE, rotten branches, and dead or broken tops. Suspect classification is made on the basis of the above signs of decay only; no other abnormalities are used.

sustained yield The yield that a forest can produce continuously at a given intensity of •MANAGEMENT. Sustained-yield management therefore implies continuous production so planned as to achieve at the earliest practical time an annual balance between •INCREMENT (i.e. growth) of a crop of trees and cuttings made from it.

swarm The simultaneous •EMERGENCE or assembly in one place or locality of large numbers of one •SPECIES of •INSECT.

switching A change in the focus of •BARK BEETLE •AGGREGATION and attack from one •HOST tree, with a relatively large number of beetles on it, to another, as yet uncolonized tree.

symbiosis A relationship in which two or more different organisms live together in close association. See •COMMENSALISM, •MUTUALISM, •PARASITISM.

sympatric Said of •SPECIES or •RACES inhabiting the same or overlapping geographical area(s).

symptom 1. Visible reaction of the •HOST plant to •INFECTION, •DISEASE, or other •PEST attack. Cf •SIGN. 2. The external and internal reactions or alterations of an organism as a result of a •DISEASE or •PEST. Cf •SIGN.

syndrome 1. The pattern of •SYMPTOMS and •SIGNS in a •DISEASE. 2. The totality of effects produced in a •HOST by a particular •DISEASE, whether simultaneously or successively and whether detectable to the unaided eye or not.

synergism 1. An association of two or more organisms or •ABIOTIC environmental factors acting at one time or in sequence, and effecting a change in another organism that one only is not able to make. 2. The combination of two or more substances, at least one being a •PESTICIDE, applied mixed or separately, leading to a greater •TOXIC effect than would be expected from the effect of each applied alone. Cf •ANTAGONISM, •COMPATIBLE.

synergist A chemical added to a •PESTICIDE to increase the level of activity of the •ACTIVE INGREDIENT. See •SYNERGISM.

synomone A •SEMIOCHEMICAL emitted by an individual of one •SPECIES which, when contacted by an individual of another species, induces a behavioral or physiological response favorable to both. See •SEMIOCHEMICAL, •ALLELOCHEMIC. Cf •ALLOMONE, •KAIROMONE, •PHEROMONE.

systematic sampling A •SAMPLING scheme in which samples are chosen according to a fixed pattern, e.g. at regular intervals along a line, rather than at random. Variation within the sampling universe, e.g. a •STAND, is assumed to be random, so that the resulting set of •SAMPLES is considered to be random. Cf •RANDOMIZATION.

systemic Spreading internally throughout the body.

systemic infection 1. An •INFECTION affecting or spreading internally throughout the •HOST's body; not •LOCALIZED. 2. A •DWARF MISTLETOE •INFECTION in which the absorptive system of the •PARASITE is in the terminal bud of the •HOST twig and keeps pace with the twig's growth.

systemic pesticide A chemical which is transported through the •VASCULAR system of a plant. In the case of an •INSECTICIDE or •ACARICIDE, the purpose is to reach sucking •INSECTS or •MITES. In the case of a •TRANSLOCATED •HERBICIDE, the chemical can pass through the plant and even to other plants, via •ROOT grafts, producing its effects throughout the plant, rather than merely at or near the points of contact. In the case of a •FUNGICIDE, the •TARGET •FUNGUS is affected at points beyond the point of contact.

T

target The organism at which a particular chemical or other •CONTROL or •MANAGEMENT treatment is directed. Cf •NON-TARGET ORGANISM.

target area 1. The area to which a •PESTICIDE or other treatment is to be applied. 2. Surface area of poten-

tial •HOSTS exposed to •FUNGAL •SPORES or •DWARF MISTLETOE •SEEDS.

target canker A •PERENNIAL CANKER characterized by prominent, concentrically arranged zones of •CALLUS, which mark alternate outgrowth and death of the edge of living tissues surrounding the wound.

tarspots 1. Large black blotches on the foliage of hardwoods, due to •FUNGI. 2. Common name for the •LEAF spot diseases of maples, due to •SPECIES of the •FUNGUS *Rhytisma*.

taxon (plural = taxa) Any taxonomic category, i.e. any category into which organisms are grouped based on their natural, and presumed evolutionary, relationships. Examples, in order of increasing scope, are: subspecies, •SPECIES, genus, family, order, class.

teneral adult = •CALLOW ADULT.

tent caterpillar A •LARVA of the •MOTH family Lasiocampidae which in its earlier stages lives •GREGARIOUSLY in a large silken nest or matting that is woven on, and sometimes envelops, the •HOST plant. The term is also applied to some •INSECTS, e.g. the forest tent caterpillar, which do not construct true tents.

teredo (= shipworm) A wood-boring marine mollusc, belonging to the genus *Bankia* or to the genus *Teredo*, that damages pilings and water stored logs. Cf •GRIBBLE.

terminal shoot = •LEADER.

thallophyte An obsolete term used to designate the algae and •FUNGI among the so-called non-vascular plants. Modern evolutionary classification systems do not consider algae or fungi to be true plants.

thorax The second, i.e. middle, body region of •INSECTS, which bears the true legs and the wings. It is divided into three sections, the pro-, meso- and metathorax, each bearing one pair of legs, and the former never bearing wings.

thrifty Growing vigorously. Used especially to describe young seedlings or trees.

tie point 1. A permanent feature identifiable from aerial photography and on the ground, used as a reference point in timber •CRUISING, aerial •SURVEYING, and •GROUND TRUTHING. 2. Points common to two laterally overlapping flight strips of •VERTICAL AERIAL PHOTOGRAPHS used to compile the strips on a common scale.

tolerance 1. Relative ability of an organism to endure injurious effects of an adverse •ENVIRONMENTAL condition. The antonym of •SENSITIVITY. Cf •IMMUNITY, •RESISTANCE. 2. See •SHADE tolerance. 3. A •HOST/•PEST interaction in which the host exhibits •SIGNS and •SYMPTOMS characteristic of a •SUSCEPTIBLE interaction but is damaged less by the interaction or can recover more readily than can a susceptible host. Cf •IMMUNITY, •RESISTANCE, •SUSCEPTIBILITY. 4. See •TOLERANCE LEVEL.

tolerance level The amount of a •PESTICIDE that may safely and legally remain as a •RESIDUE in a food plant or in meat or fat.

top-kill 1. Relatively rapid death or •DIEBACK of the •LEADER and more or less of the upper portion of the •CROWN. 2. A tree with a portion of the •CROWN and •STEM killed, from the top down, by •INSECTS or some other cause, with the remainder of the •STEM and lower •CROWN remaining green. Cf •SPIKE-TOP.

toxic Of, caused by, or acting as a poison. See •TOXICITY, •TOXICANT, •TOXIN.

toxicant A poisonous substance, regardless of origin or source. Cf •TOXIN. See •TOXIC, •TOXICITY.

toxicity 1. The ability to act as a poison. 2. The degree to which a substance is •TOXIC, measured in terms of the degree of injury to an organism or the death rate of a •POPULATION. See •L.C.50, •L.D.50.

toxin A poisonous substance produced by a living organism.

transect 1. A cross section of an area used as a •SAMPLE unit for recording, mapping, or studying the vegetation and its use. May be a series of plots, a belt or strip, or merely a line, depending on the purpose. See •PROBE, •SURVEY. 2. A narrow •SAMPLE strip (strip transect) or a measured line (line-transect) taken through vegetation chosen for study. Cf •LINE-INTERCEPT METHOD.

translocation 1. The active movement of dissolved substances from one part of a plant to another. 2. Same as 1., but restricted to movement through the •PHLOEM.

transmission The transfer of an •INFECTIOUS agent from one •HOST individual to another. See •VECTOR.

trap tree A tree treated in some manner to make it an acceptable •HOST for •BARK BEETLES or other •PESTS, e.g. felled in the shade for spruce beetle or standing and •SEMIOCHEMICAL-•BAITED for mountain pine beetle. Lethal trap trees are treated so as to kill the •INSECTS arriving at or •INFESTING them, e.g. with surface or •SYSTEMIC •INSECTICIDES or •HERBICIDES. Otherwise, infested trap trees are harvested and the •INSECTS killed in timber processing and manufacturing activities. Trap trees that have been felled, limbed and/or bucked are sometimes referred to as trap logs.

trophic level Position in a food chain, e.g. primary producer, primary consumer (herbivore), secondary consumer (•PREDATOR or •PARASITE).

tubercle A small, rounded nodule or projection from the surface of an organ.

tussockosis Allergic reaction of humans to contact with the irritating body hairs of Douglas-fir tussock moth •LARVAE, often shed by the larvae and carried on the wind or left embedded in the egg masses of this •INSECT.

U

univoltine Condition of an animal, e.g. an •INSECT or •NEMATODE, in which only one •GENERATION is produced per year or season. Cf •BIVOLTINE, •MULTIVOLTINE.

unmerchantable Of a tree or •STAND that has not attained sufficient size or volume or which is of insufficient quality to be suitable for •HARVESTING. Cf •MERCHANTABLE.

utilization limit The minimum height of stumps and size of timber that must be removed from a site and utilized, according to specifications set in a particular cutting permit.

V

variety 1. A division of a •FREE-LIVING •SPECIES which, on the basis of characterisitics of form and physiology, can be differentiated from another group of individuals of the same species. Cf •CULTIVAR. 2. One or more •RACES of a •PATHOGEN or •PARASITE that are characterized by the limitation of their •HOST range to organisms in certain •TAXA. See •*FORMA SPECIALIS*. 3. An assemblage of cultivated plants that are distinguished by any characteristics (morphological, physiological or other) significant for the purposes of agriculture, forestry or horticulture, and that, when reproduced, sexually or asexually, retain their distinguishing features. The term •CULTIVAR (cultivated vari-

ety) is considered by some to be preferable to the term variety as applied to a deliberately selected variant of a cultivated plant. The term variety is then reserved for a variant found in nature.

vascular Term applied to a plant conductive tissue or a region consisting of such tissue, i.e. •PHLOEM, •XYLEM; or describing a plant with such tissue, i.e. ferns, •ANGIOSPERMS, •GYMNOSPERMS; or describing a •PATHOGEN that grows primarily in such tissues.

vector 1. Any agent, particularly an •INSECT or •NEMATODE, but also •SEED, wind and water, capable of transferring a •PATHOGEN from one •HOST to another. Cf •CARRIER. 2. An organism which contains or carries a •PATHOGEN in an infectious •STAGE, and is normally a necessary link between one or several •HOSTS. A mechanical vector carries the pathogen externally; a vector in which the pathogen multiplies and/or maintains itself may sometimes be considered to be a •HOST. Cf •CARRIER.

vegetation management The act of manipulating vegetation and microenvironment to direct site resources into producing the vegetation complex desired to meet •MANAGEMENT objectives, while meeting concerns for improving wildlife •HABITAT, grazing, scenic value, recreation and watershed. Vegetation management in forestry may have diametrically opposed objectives to those in other venues, e.g. rights of way.

vegetative Pertaining to plant or •FUNGAL organs or parts which usually function in absorption, growth and development rather than in reproduction. The distinction between 'vegetative' and 'reproductive' applies particularly to sexual reproduction.

vegetative infection (=inactive infection, passive infection, sleeper) A •DWARF MISTLETOE •INFECTION that does not produce •AERIAL SHOOTS; most often occurs on heavily shaded branches or on •INCOMPATIBLE HOSTS. Cf. •REPRODUCTIVE INFECTION.

vegetative phase Refers to the growth stage of a •MICROORGANISM, •FUNGUS or plant in contrast to the reproductive phase; involves the absorption and buildup of nutrients into complex constituents of the organism.

vegetative reproduction Production of new plants by any asexual method, i.e. not by •SEED.

vertical aerial photograph An aerial photograph made with the camera axis held vertical (or as nearly vertical as is practicable) in an aircraft. Cf •OBLIQUE AERIAL PHOTOGRAPH.

vertical intensification Upward •INTENSIFICATION, i.e. increase in the number of •DWARF MISTLETOE •INFECTIONS within a single tree.

vertical resistance (=race specific resistance, specific resistance) •RESISTANCE to some but not all •RACES of a particular •PATHOGEN. The ranking of •HOST •VARIETIES by degree of resistance may thus vary depending on the •GENOTYPES of the •PATHOGENS to which they are exposed. Conversely, ranking of the pathogen genotypes by degree of •VIRULENCE may vary depending on the genotypes of the hosts to which they are exposed. Usually •MONOGENIC or •OLIGOGENIC, i.e. controlled by one or a few genes. Cf •HORIZONTAL RESISTANCE.

viability The capacity of a seed, pollen grain or •SPORE to •GERMINATE and develop under given conditions.

virulence Degree of •PATHOGENICITY; especially of a particular •ISOLATE, •PATHOTYPE or •STRAIN.

virulent Capable of causing a severe •DISEASE; strongly •PATHOGENIC. Cf •NON-VIRULENT.

virus An •INFECTIVE entity, generally consisting of a nucleic acid surrounded by protein, so small that it can only be visualized with an electron microscope, that multiplies only within the living cells of a •SUSCEPTIBLE •HOST, and is potentially •PATHOGENIC.

volatility The tendency of a substance to evaporate or be vaporized, i.e. change from a solid or liquid to a gas, at ordinary temperatures and atmospheric pressures. Use of a highly volatile •PESTICIDE increases the likelihood of contamination beyond the •TARGET AREA. See •DRIFT.

W

walk-through The least intensive type of ground •SURVEY for •INSECT or •DISEASE •DAMAGE. A traverse starting at a legal survey point or photo •TIE POINT with distance and bearings marked on each line segment. Usually, only a qualitative estimation is made.

weed A plant growing where it is not desired, i.e. a plant interfering with human activity or welfare, and which therefore is a •PEST. Includes •HERBS, •SHRUBS and trees, and may include specimens of desirable •SPECIES, e.g. when •STANDS are overstocked, superfluous trees are weeds.

weeding The removal or suppression of •WEEDS by cultural, physical or chemical means.

weed suppression The process of preventing or retarding •WEED growth.

weed tree Any tree of little or no economic or other value on the •SITE in question.

weevil A •BEETLE of the extensive family Curculionidae, characterized by the •ADULT head being more or less prolonged into a beak or snout, bearing clubbed, elbowed antennae, and by curved, legless •LARVAE (•GRUBS). Many •SPECIES, as adults and/or larvae, are serious forest •PESTS, particularly as root and •TERMINAL •SHOOT borers in •CONIFERS and as root pests in nurseries.

wet rot 1. A •ROT which is accompanied by release of water from the disintegrating cells. 2. A •DECAY of wood that is characterized in its active state by a high water content, the rotting mass yielding water readily under moderate pressure, as with certain •WHITE ROTS.

wetwood Wood, particularly •HEARTWOOD, with an abnormally high water content and a translucent, glassy appearance, the condition developing in the living •STEM and not through soaking in water. Found in both •SOFTWOODS and •HARDWOODS, and of uncertain origin, though in some trees, e.g. elms, associated with •BACTERIA.

white rot In wood, any •DECAY or •ROT attacking both the •CELLULOSE and •LIGNIN, producing a generally whiteish cellulose residue that may be spongy or stringy in texture or occur as •POCKET ROT, as e.g. with *Fomes annosus*. Cf •BROWN ROT.

white-spot A whitish heat-induced •LESION on the •STEMS of young seedlings, resulting from high soil temperatures at the ground line. Cf •SUNSCALD.

wilt 1. Loss of rigidity and drooping of plant parts due to inadequate water supply. 2. A •DISEASE characterized by this •SYMPTOM, due to a •VASCULAR infection which interferes with normal water uptake or conduction. Cf •BLIGHT.

windthrow (=windfall) A tree uprooted by the wind. The occurrence of windthrow may indicate an underlying •PEST problem, e.g. the presence of •ROOT ROT.

winter drying (= winter kill) Desiccation of foliage or twigs by dry winds at times when water conduction is restricted by cold soil or by freezing of plant tissues or of the soil.

winter sunscald Localized •INJURY to •BARK and •CAMBIUM, often resulting in wounds or •CANKERS, caused by freezing following the unseasonable heating of the bark by the sun in winter; hence it is localized on the side of the •STEM exposed to the midday and afternoon sun. See •SUNSCALD.

witches' broom In woody plants, an abnormal shortening of •INTERNODES and proliferation of weak •SHOOTS, forming a dense brushlike mass. Commonly induced by •DWARF MISTLETOE, •RUST FUNGI or other organisms, but sometimes a response to •ABIOTIC •ENVIRONMENTAL •STRESSES. Mistletoe brooms are evergreen, while needles of brooms induced by rusts generally last only one year.

wolf tree A vigorous tree, usually a •RESIDUAL in a plantation setting or an open-grown tree of poor growth form, with a broad spreading •CROWN and occupying more growing space than its value warrants. Frequently serves as a source of •PESTS causing •DAMAGE to young plantation trees. Cf •HOLDOVER.

woolly aphid An •APHID covered by waxy scales or threads, e.g. the balsam woolly aphid, *Adelges piceae*.

wound gum A dark, amorphous, •GUMMY substance produced in the wood of •HARDWOODS and some •CONIFERS in response to •INJURY, •INFECTION or other irritation. See •GUM.

wound parasite A •PARASITE that can enter a •HOST and establish itself only through wounds or injured tissue.

wound stain A discoloration of wood originating in or developed as a result of a wound in a tree. See •STAIN.

X

xylem The principal strengthening and water conducting tissue of •STEMS, leaves and roots. See •PHLOEM, •VASCULAR.

xylem stimulation •HYPERTROPHY or •HYPERPLASIA of •XYLEM cells of the •HOST, usually due to •DWARF MISTLETOE •INFECTION, producing grossly distorted annual rings.

Y

yellows A •DISEASE in which yellowing or •CHLOROSIS of plant tissue is a principle •SYMPTOM.

Z

zone line A narrow orange, brown or black line of decomposition products or •FUNGAL tissue in •DECAYING wood, often delimiting a small, irregular area of •DECAY.

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